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Exploring Microneedling in Acne Scar Treatment - A Review of Cases

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Abstract:

Introduction: Post acne scars impact an individual's self-esteem and appearance. Various therapeutic methods can be used to lessen the scar, such as, laser, dermabrasion, surgical excision. Microneedling is one of the recent technologies in this aspect that focuses on breaking down damaged collagen of dermis and promotes neo-collagen formation. ***Methods:*** 65 patients with mild to moderate post acne atrophic scar were included in this study. All patients received 5 sequential treatments of microneedling with an interval of 4 weeks. A blinded dermatologist assessed patient outcome according to qualitative global acne scarring system grading of Goodman & Baron. Patients were questioned about their satisfaction and any adverse reaction at an interval. ***Result:*** 48 patients under study were women, and 17 were men. Their ages varied from 15-35 years old. Of them 27% had a positive family history of acne scarring. The average length of the illness was 6.80 ±1.16 years, while the average time for scarring was 4.75 ±1.18 years. With varies type of complications, common are post-inflammatory hyperpigmentation and post procedure pain; but most of the case had no complains. Most of the patient's response were very good (73%) than excellent (20%). ***Conclusion:*** Microneedling is reviewed as a well satisfactory mode of treatment in post acne scars.
Keywords: Microneedling, Acne scar.

INTRODUCTION:

Around 95% of acne scars manifest on the face[1]. Acne scars can significantly impact one's appearance and self-esteem. Both men and women struggle with post acne scars. Scarring is usually related to the severity and stage of inflammation, nature of local manipulation, nature of treatment and as well as individual predisposition to scarring[2]. Understanding different types of acne scars can help in managing and reducing their appearance. The various types of post acne scarring include atrophic, hypertrophic, keloidal. Boxcar, icepick and rolling are most common subtypes of atrophic scars[3].

Various treatment modalities are available for post -acne scars including chemical peels, dermabrasion, lasers, microneedling, etc. These can reduce the disfiguring impact of post-acne scars[4].

Microneedling has been used to reduce skin imperfection by percutaneous collagen induction since 1995[5]. It has mostly been proposed as an effective method of treating wrinkles and scars[6]. Microneedling creates micro-channels and micro-wound at level of dermis and breaks compact, thickened collagen thus inducing wound healing[7]. also, microneedling provides a suitable clear channel for topical agents, such as PRP, to be absorbed more effectively through the top layer of the skin[8].

In this study we explored the efficacies of microneedling for treatment of post-acne scar in the facilities of a Bangladeshi hospital.

METHODOLOGY:

This study was a single centre, prospective clinical trial, reviewing the efficacies of Microneedling in patients with post acne scars. Sixty-five (65) patients were included in the study. Most of the patients were recruited from the outpatient facility of the Skin and VD department and some from the outpatient facility of the Burn and Plastic surgery Department of Dhaka National Medical College Hospital, Dhaka from January, 2023 to June, 2024.

Inclusion criteria: Male and Female patients aged 12 to 40 years, having mild to moderate post-acne atrophic scar were included in this study.

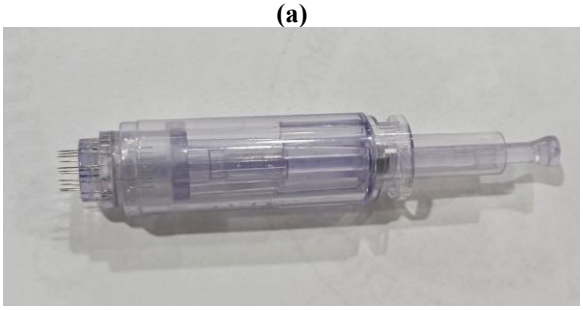
Exclusion criteria: Individuals who have taken topical or systemic acne treatment in the past one month, individuals prone to keloid, individuals suffering from any active infection on the face, or with any autoimmune disease, pregnant or lactating individuals and individuals suffering from any bleeding disorders were excluded from the study.

All patients received five consecutive treatments of Microneedling using Dermapen with an interval of 4 weeks. We used Dermapen with adjustable needle depths from 0.25 to 3.0mm. The focused area was first prepared with antiseptic and saline after proper topical anaesthetic application. The skin was held in one hand and with the other hand microneedling was done five times each- horizontally, vertically and obliquely. The endpoint of treatment was determined by uniform pinpoint bleeding. After the treatment, the area was cleansed with saline and cool packs were used for patient comfort. Then the patient was advised clearly to use topical antibiotics, use regular sunscreen and take other sun protective measures.

The final assessment was done 3 months after the last session. A blinded dermatological consultant assessed treatment outcome for each patient. He commented on the photos of before and after treatment side by side. The changes were assessed photographically and also qualitative global acne scarring system grading of Goodman & Baron were used to compare baseline conditions. Scars improving by two grades or more were labelled as 'excellent' response and one grade improvement was labelled a 'good' response. The response was labelled 'poor' if the grades remained the same. Also, patient's self-assessment was marked at the final visit. Patients scored their response as poor (0-24%improvement), good (25-49% improvement), very good (50-74% improvement) or excellent (75-100% improvement). Follow up of patients were done at two-monthly interval for one year. Side effects were assessed and addressed. Side effects included infection, erythema, oedema and pain.

Figure 1: Electric Dermapen used for microneedling

(a)



(b)

Figure 2: Disposible needles used in Dermapen, with (a) and without (b) protective cap

Figure 3: Pre and after multiple sessions of microneedling

RESULTS:

Table 1: Clinical characteristics of Acne patients (n-65)

Variables	Frequency (%) / Mean ± SD
Sex	
Male	17 (26%)
Female	48 (74%)
Duration of disease (Years)	6.8 ± 1.16
Duration of scar (Years)	4.75 ± 1.18
Family history	
Yes	18 (27%)
No	47 (73%)

Forty-eight patients under study were women, and seventeen were men. Their ages varied from fifteen to thirty-five years. Of their 27% had a positive family history of acne scarring. The average length of the illness was 6.80 ±1.16 years, while the average time for scarring was 4.75 ±1.18 years (Table 1).

Table 2: Adverse events of study (n-65)

Adverse events description	Number of Studies reporting
1. Post-inflammatory hyperpigmentation	1. 12
2. Post procedure pain	2. 10
3. Scabbing / Crusting	3. 04
4. Purpura / ecchymosis	4. 03

5. Railroad scarring	5. 02
6. Acne flares	6. 01
7. Cervical lymphadenopathy	7. 02
8. Pustules / Bullae	8. 06
9. Allergic reaction to neck	9. 01
10. Herpes simplex reactivation	10. 03
11. No complains	11. 21

With varies type of complications common are post-inflammatory hyperpigmentation (n-12) and Post procedure pain (n-10); but most of the case has no complains (Table 2).

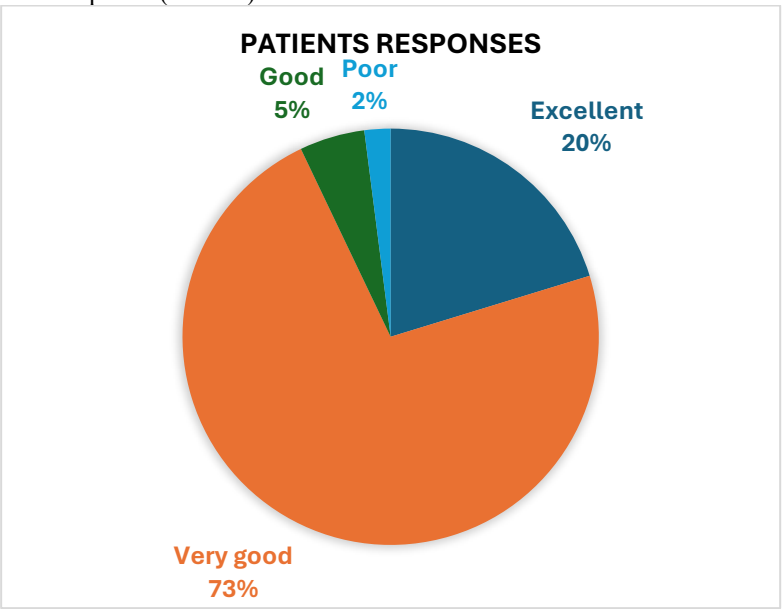


Figure 4: Patients responses (n-65)

DISCUSSION:

Microneedling is a relatively new procedure in this country. The mechanism includes creating tiny epidermal channels followed by dermal injury[9]. Also the release of several growth factors including platelet derived growth factor, fibroblast growth factor and trans forming growth factor alpha and beta, which stimulate the migration and proliferation of fibroblasts[10].

Many different terms and surgical procedures have been used to address the types of acne and improve appearance of scars[11]. In some patients the severe inflammatory response results in textural changes in superficial and deep dermis leading to post acne scars.

This study was designed to review cases after treatment with microneedling on post acne scars. Our study showed significant improvement in atrophic acne scars with Dermapen. Regarding patient satisfaction grades there was a substantial amount of excellent responses (20%) Majid[12] studied the efficacies of PCI through Dermaroller in treatment of atrophic facial scars of various aetiology and found excellent response in 72.2%, good response in 16.7% and failure to improvement in 11.1% patients.

At the completion of the study and two months later, none of the patients reported a worsening in scar severity as compared to initial treatment level. Similar to our findings, other researchers like Phuong et al. have reported on the safety and efficacy of microneedling[13].

Fabbrocini et al.[8] in a study found PRP in combined with Microneedling was effective in acne scars and showed that the grade of severity of acne scars in all patients was greatly reduced after only four sessions with 8weeks interval. Although our studies were conducted at 4weeks interval we found similar results with Microneedling alone.

Our patients experienced significantly less erythema and oedema and pain. Similar to the study by Dogra etal.[14], who reported that post procedure oedema subsided by 2-3days after microneedling for acne scar.

Limitations of study:
A relatively small number of patients were studied and, in many cases, long-term follow up was not possible due non-compliance of the patients.

CONCLUSION:
Our study finds that the use of microneedling in treatment of post acne scars were found to be effective and satisfactory.

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