

Research

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Comparison of Efficacy of Micro Needling For the Treatment of Acne Scars in Asian Skin with and without Subcision

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Keywords: Micro needling, Subcision, Acne scars, Asian skin

Abstract

Objective: The objective of study is to compare the efficacy of micro needling for the treatment of acne scars in Asian skin with and without subcision.

Study Design: A randomized controlled trial.

Settings: This study was conducted from May 2014 to July 2014, in the department of dermatology DHQ hospital, Faisalabad, Pakistan.

Patients and Method: Total of 70 patients having acne scars were randomly divided into two equal groups having 35 patients in each group. Group 1 underwent micro needling alone every month for 3 consecutive months and Group 2 underwent micro needling and subcision both (combined in a single session) every month for 3 consecutive months. To determine efficacy, a simple 5 grade scoring system was used in either group, with grade 0 (no improvement), grade 1 (minimal improvement), grade 2 (good improvement), grade 3 (very good improvement), grade 4 (excellent improvement), where minimal is 25%, good is 50%, very good is 75% and excellent is 100%. Efficacy was considered as obtaining grade 1 or above.

Results: Efficacy was present in 27 patients (77.1%) in group A and 35 patients (100%) in group B. Efficacy was not seen in 8 patients (22.9%) of group A. In age group 15-20 yrs: Efficacy was present in 3 patients of group A (75%) and all the 3 patients of group B (100%). In one patient of group A (25%) the treatment was not effective. P value was 0.350. In age group 21-25 yrs: Efficacy was present in 9 patients of group A (69.2%) and 13 patients of group B (100%). In 4 patients of group A (30.8%), the treatment was not effective. P value was 0.030. In age group 26-30 yrs: Efficacy was present in 15 patients of group A (83.3%) and 19 patients of group B (100%). In 3 patients of group A (16.7%) the treatment was not effective. P value was 0.063. In males: Efficacy was seen in 14 patients of group A (66.7%) and 18 patients of group B (100%). 7 patients in group A (33.3%) did not respond to the treatment. P value was 0.007. In females: Efficacy was seen in 13 patients of group A (92.9%) and 17 patients of group B (100%). One patient in group A (7.1%) did not show efficacy. P value was 0.0263.

Conclusion: The combination of treatment modalities (micro needling and subcision) for treating acne scars have better results as compared to micro needling alone. Males are more commonly and more severely affected by acne scars. If duration of study is extended beyond 3 months then even better results can be achieved in both groups. Achieving grade 0 i-e complete recovery of acne scars is very difficult even if combination of treatment modalities is used.



Figure 1. Pin point bleeding, the end point of dermaroller therapy



Figure 2. The beveled tip of a 20-G microvitreoretinal blade

Introduction

Acne has a prevalence of over 90% among adolescents and continues in adult hood in approximately 12–14% of cases. In some patients, the severe inflammatory response results in permanent scars [1]. Acne scarring causes problems cosmetically and psychologically. Unfortunately, there has been no standard treatment option for the treatment of acne scars. Various therapeutic options have been described with variable clinical outcomes and complications, such as surgical techniques (punch graft, punch excision, subcision), resurfacing techniques (dermabrasion, ablative laser treatment, chemical peels), non ablative laser treatment, autologous fat transfer, and injection of dermal fillers [2].

Skin needling, also known as per cutaneous collagen induction (PCI), with derma roller (a needling tool) is an addition for managing post acne scars [3].

Subcision is defined as a method for subdermal undermining of the depressed areas or it is undermining of scars, wrinkles or cutaneous depressions by breaking up the attachments of these contour abnormalities and releasing the surface from deeper structures. Since 1995, subcision was established as effective means of correcting rolling depressed acne scar and wrinkles. Orentreich and Orentreich [4], who first described the procedure, called it subcision to stand for subcutaneous incision less surgery for correction of depressed scars and wrinkles. It has been used for treatment of acne scars on limited bases [4, 5, 6, 7, 8]. Subcision have been also tried to treat striae and cellulite [9, 10]. The aim of the current study was to evaluate its effective-

ness in combination with micro needling by comparing it with micro needling alone.

Resurfacing procedures from many decades have been considered to have main importance for acne scars, but they should not be considered in isolation, and one need to combine modalities to maximize out comes [7]. A study from Italy in 2009 showed an average of 25% reduction in acne scars in both sexes after micro needling alone [11]. A study from Germany and Brazil in 2011 showed 70% reduction in acne scars when micro needling and subcision are used in combination [12].

According to our knowledge, no local data is available in our country regarding the comparison of micro needling alone and micro needling in combination with subcision for the treatment of acne scars. By comparing the efficacy of micro needling with and without subcision for the treatment of acne scars, we can provide guidelines at least at local level and especially in Asian skin, which is the main skin type in our country. More over international data regarding the efficacy of micro needling and subcision in combination for acne scars is sparse.

Materials and Methods

After taking approval from ethical review committee, patients of dark skin of age 15-60 years, of either sex, presenting with acne scars to the Department of Dermatology, DHQ Hospital, Faisalabad were enrolled in the study. Patients having bacterial, viral and fungal skin diseases in addition to acne scars were excluded from the study. Also patients having systemic diseases like diabetes, hypertension, ischemic heart disease and malignancy were excluded. Patients on systemic steroids or other immunosuppressants and patients



Figure 3. (a) Patient in group B before start of treatment (right cheek)
(b) Patient in group B after 3 month treatment of dermaroller and subcision (right cheek)

having history of keloid formation after wounds were also not enrolled in the study. A detailed examination with special reference to the skin type and type of acne scars was done. Patients were randomly divided into two groups by using computer generated random number table. Group 1 underwent micro needling alone. Group 2 underwent micro needling along with subcision, simultaneously in a single session. Total of 3 sessions were done in both the groups one month apart. Every month before starting procedure, all the patients were photographed using canon EOS Rebel XS 1000D professional digital camera using same camera settings and same light settings for all the patients. At the end of the study, these photographs were printed by canon E11 continuous ink system colored printer, using maximum resolution. These photographs were analyzed by 5 grade scoring system. Follow up was done by taking contact no of patient. Efficacy was noted after 3 months. Information was recorded on Performa.

The procedure of micro needling was performed under topical anesthesia in the form of locally available cream containing 13 percent lidocaine and ethylene glycol, which was applied to the area to be treated. After an hour, the anesthetic cream was removed with methylated spirit. Cleansing was carried out with povidone iodine. Normal saline was used as the final cleanser to prevent any discomfort to the patient. The derma roller was rolled on to the skin with one hand while stretching the skin with the other hand so that the base of the scars could be reached. Minimal pressure was applied to the derma roller and the movements were kept short. Care was taken to avoid applying lateral pressure while rolling the instrument on the skin to avoid scarring. The instrument was moved backward and forward 6–10 times in four directions; horizontally, vertically, and diagonally right and left to cover an area of roughly 2 * 2 inches until uniform pinpoint bleed-

ing was seen (**Figure 1**). This uniform pinpoint bleeding was taken as the end point. The serous ooze was wiped and the area was cleansed with moist gauze. A thin layer of mupirocin ointment was applied to the treated areas. Erythema and edema appeared immediately after treatment and persisted for up to 48h. However, patients resumed normal activities within 12h. There was mild scabbing for about 2–3 days. All the scabs fell off without leaving any visible marks. Patients were advised to avoid the use of scrubs, abrasive cleansers and to avoid sun exposure for a week to prevent postinflammatory hyperpigmentation. Micro needling was repeated once in 4 weeks for three sittings.

The procedure of subcision was performed by a 20-G microvitrectomy (MVR) cataract blade (**Figure 2**). This was used to incise the skin, subdermally and immediately inferior to the acne scar. The tip of the MVR blade has a dual bevel structure that consists of blades on both sides. Using a back and forth sweeping motion, there is immediate lifting. Blood pools beneath the scar and acts as a spacer. Because the blade is diamond shaped, with a triangular point, it allows easy side to side movement with a cutting motion, as opposed to the tearing or shearing motion often seen with other instruments. Three treatment sessions were done in group B along with micro needling simultaneously in single sitting at every month for 3 consecutive months. The contraindications to subcision include current cystic acne, bleeding disorders, infection, and use of oral isotretinoin.

Results

Seventy patients (both males and females), who were having acne scars of different grades were enrolled in the study. This was a randomized controlled trial. All data was analyzed using SPSS version 22. Descriptive statistics were calculated for all va-

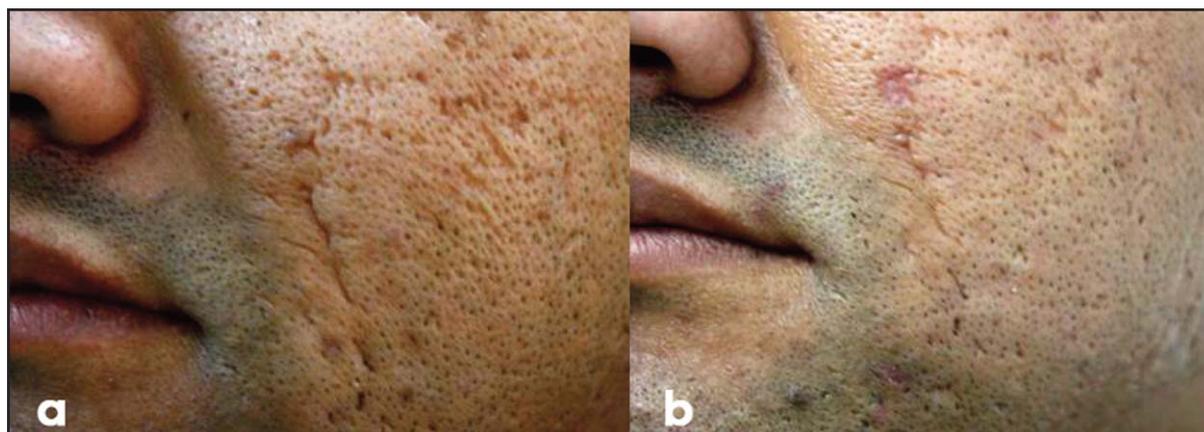


Figure 4. (a) Patient in group B before start of treatment (left cheek)
(b) Patient in group B after 3 month treatment of dermaroller and subcision (left cheek)

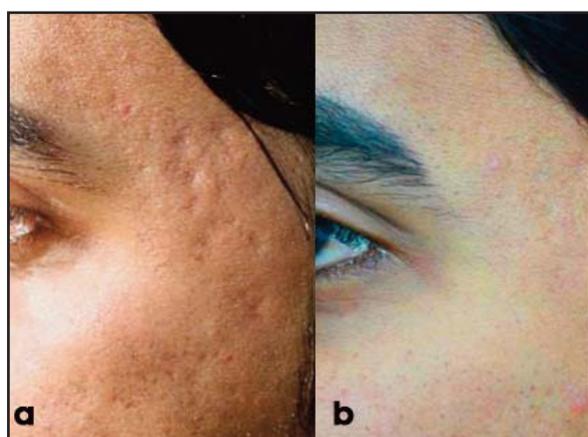


Figure 5. (a) Patient in group A before start of treatment
(b) Patient in group A after 3 month treatment with dermaroller

riables. Mean and standard deviation was calculated for all quantitative variables like age. Frequency and percentage were calculated for all quantitative variables like gender, grades at baseline and after 3 months and efficacy. Chi-square test was used to compare efficacy between two groups. p value less than 0.05 was taken as significant. The percentage of male and female patients in the study was established. Of the 70 patients enrolled in the study, 39 (55.7 %) were males and 31 (44.3 %) were females. All the patients' ages ranged from 17 to 30 years. Mean and standard deviation of the sample was calculated for age. The mean age of the patients was 25.07 years with a standard deviation of 2.95 years. Regarding age distribution, most patients 37 (52.9 %) were in age group of 26-30. Regarding grades of acne scars at baseline, 30 patients (42.9%) were having grade 2. 18 patients (25.7 %) were having grade 3. 22 patients (31.4 %) were having grade 4 (**Table 1**). Regarding grades of acne scar after 3 months of treatment, no patient could achieve grade 0 in

group A and 6 patients in group B (17.1%) achieved grade 0. 4 patients in group A (11.4%) remained in grade 4 while no patient remained in grade 4 in group B (**Table 2**).

Comparison Of Efficacy Between Group A and Group B

Efficacy was present in 27 patients (77.1%) in group A and 35 patients (100%) in group B (**Figures 3a and b, 4a and b, and 5a and b**). Efficacy was not seen in 8 patients (22.9%) of group A (**Table 3**). Efficacy according to age distribution was as follows, In age group 15-20 yrs: Efficacy was present in 3 patients of group A (75%) and all the 3 patients of group B (100 %). In one patient of group A (25%) the treatment was not effective. P value was 0.350. In age group 21-25 yrs: Efficacy was present in 9 patients of group A (69.2%) and 13 patients of group B (100%). In 4 patients of group A (30.8%), the treatment was not effective. P value was 0.030. In age group 26-30 yrs: Efficacy was present in 15 patients of group A (83.3%) and 19 patients of group B (100%). In 3 patients of group A (16.7%) the treatment was not effective. P value was 0.063 (**Table 4**). Efficacy according to gender distribution was as follows, In males: Efficacy was seen in 14 patients of group A (66.7%) and 18 patients of group B (100%). Seven patients in group A (33.3%) did not respond to the treatment. P value was 0.007. In females: Efficacy was seen in 13 patients of group A (92.9%) and 17 patients of group B (100%). One patient in group A (7.1%) did not show efficacy. P value was 0.0263 (**Table 5**).

Table 1. Grade of Acne at Baseline

	Group		Total
	Group A	Group B	
Grade of acne at baseline	2	15	15
		42.9%	42.9%
	3	8	10
		22.9%	25.7%
	4	12	10
		34.3%	28.6%
Total		35	35
			70

Table 2. Grade of Acne After 3 Months

	Group		Total
	Group A	Group B	
Grade of acne after 3 months	0	6	6
		17.1%	8.6%
	1	16	19
		45.7%	54.3%
	2	10	9
		28.6%	25.7%
	3	5	1
		14.3%	2.9%
	4	4	
		11.4%	5.7%
Total		35	35
			70

Table 3. Comparison of Efficacy Between Group A and Group B

	Group		Total
	Group A	Group B	
Efficacy	yes	27	35
		77.1%	100.0%
	no		8
		22.9%	11.4%
Total		35	35
			70

Table 4. Efficacy According to Age Distribution

Age distribution		Group		Total
		Group A	Group B	
15-20 years	Efficacy	yes	3	3
			75.0%	100.0%
	no	1		
		25.0%	14.3%	
21-25 years	Efficacy	yes	9	13
			69.2%	100.0%
	no	4		
		30.8%	15.4%	
26-30 years	Efficacy	yes	15	19
			83.3%	100.0%
	no	3		
		16.7%	8.1%	

Discussion

Micro needling involves a hand-held instrument consisting of a handle with a cylinder studded with 0.5 to 2 mm long stainless steel needles all around (Figure 6). The cylinder is rolled on the skin in multiple directions. During the process of micro needling, tiny wounds are created in the papillary dermis, leading to release of growth factors, which stimulate the formation of new collagen. The effect of micro needling has recently been explained on the basis of a demarcation current produced amongst cells when micro needles penetrate the skin, which triggers a cascade of growth factors that stimulate the healing phase [13, 14].

We had used a micro needling device with 500 needles. The needles were 2mm long and spaced 2 mm apart. The second session was more aggressive than the first. The adverse effects reported included pain during the procedure, transient erythema and edema. In group B, the same procedure of micro needling was performed along with subcision.

Subcision is a simple procedure for revision of rolling acne scars. Any area on the face can be treated in minutes with an inexpensive specialized needle or VMR blade. Treated scars can become substantially less noticeable. Improved but somewhat persistent scars can be subcised again or further smoothed by a resurfacing technique [15], as we used micro needling in this study. The term subcision is trademarked (US trade mark registration number 1, 841, 017, granted June1, 1994, to David Orentreich), which means that it functions as a brand name for this procedure. Apart from originally describing the procedure, David and Norman Orentreich have been instrumental in further refining the subcision technique [16, 17]. They do not advocate use of a VMR blade, as we describe in this article, but rather of disposable tribevel-

Table 5. Efficacy According to Gender Distribution

Gender		Group		Total
		Group A	Group B	
Male	yes	14	18	32
	Efficacy	66.7%	100.0%	82.1%
	no	7		7
		33.3%		17.9%
Female	yes	13	17	30
	Efficacy	92.9%	100.0%	96.8%
	no	1		1
		7.1%		3.2%

led needles [18, 19]. A few precautions need to be observed during subcision. Anesthesia must be sufficient to ensure patient comfort and minimize bleeding. Placement of the needle should be meticulously planned, always in the superficial fat. The extremely sharp cutting edge, indispensable for subcision, is a threat to deeper facial structures and must be oriented parallel to the underside of the dermis. Subcision should be performed with caution in areas where the major motor nerves, particularly the facial nerve and its branches, are vulnerable. For instance, care should be taken to avoid deep subcision in the preauricular cheek, where the facial nerve emerges, and over the temple and mandibular rim, where facial nerve branches are superficial and easily injured. If there is doubt about the safety of the procedure at a particular site, subcision should be deferred. Appropriate patient selection is vital. Subcision is ineffective for treating deep pitted scars and shallow or deep ‘boxcar’ scars, which are scars with depressed flat bases and vertical walls (similar to varicella scars). Conversely, bumpy, rolling scars with indistinct borders respond well to subcision and are impractical to excise. Subcision is therefore but one of a group of procedures that can be used to correct acne scars. Deep pitted and box car scars are best rectified by 2 to 4 mm punch excisions, followed by careful suturing or punch elevation of the scar without tissue removal. Linear depressions and grooves may be filled with soft tissue augmentation materials.

References

1. Jaishree S. Combination of micro needling and glycolic acid peels for the treatment of acne scars in dark



Figure 6. Dermaroller used in this study

skin. *J Cosmetic Dermatol* 2011; 10: 317-323. PMID: 22151943

2. Leheta T, EL Tawdy A, Abdel Hay R, Farid S. Percutaneous collagen induction versus full concentration trichloroacetic acid in the treatment of atrophic acne scars. *Dermatol Surg* 2011; 37: 207-216. PMID: 21269351

3. Imran I. Micro needling therapy in atrophic facial scars: an objective assessment. *J Cutan Aesthet Surg* 2009; 2: 26-30. PMID: 20300368

4. Orentreich DS, Orenreich N. Subcutaneous incision less (subcision) surgery for the correction of depressed scars and wrinkles. *Dermatol Surg* 1995; 21: 543-549. PMID: 7773602

5. Alam M, Omura N, Omura M, Kaminer MS. Subcision for acne scarring, technique and outcome in 40 patients. *Dermatol Surg* 2005; 31: 310-317. PMID: 15841633

6. Balighi K, Robati RM, Moslehi H, Robati AM. Subcision in acne scar with and without subdermal implant: clinical trial. *J Eur Acad Dermatol Venereol* 2008; 22: 707-711. PMID: 18341538

7. Goodman GJ. Treatment of acne scarring. *Int J Derm* 2011; 50: 1179-1194. PMID: 21950285

8. Fulchiero JR, Gregory J, Pamela C et al. Subcision and 1320nm Nd:YAG non ablative laser resurfacing for the treatment of acne scars: a simultaneous split-face single patient trial. *Dermatol Surg* 2004; 30: 1356-1359. PMID: 15458536

9. Al-Waiz M, Al Sharqi Ali I. Medium depth chemical peel single treatment of acne scars in dark skin individual. *Dermatol Surg* 2002; 28: 383-387. PMID: 12030868

10. Maluki AH. Facial resurfacing of atrophic acne scars using high energy pulsed carbon dioxide laser. *J Arab Board Med Specialization* 2003; 5: 105-108.

11. Fabbrocini G, Fardella N, Monfrecola A et al. Acne scarring treatment using skin needling. *British association of dermatology. Clin Exp Dermatol* 2009; 34: 874-879. PMID: 19486041

12. Uwe W, Alberto G. Minimally invasive aesthetic procedures in young adults. *Clin Cosmet Investig Dermatol* 2011; 4: 19-26. PMID: 21673871

13. Leheta T, Tawdy AE, Abdel Hay R, Farid S. Per cutaneous collagen induction versus full-concentration trichloroacetic acid in the treatment of atrophic acne scars. *Dermatol Surg* 2011; 37: 207–216. PMID: 21269351
14. Jaffe L. Control of development by steady ionic currents. *Fed Proc* 1981; 40: 125–127. PMID: 7193143
15. Branson DF. Dermal undermining (scarification) of active rhytids and scars: enhancing the results of CO2 laser skin resurfacing. *Aesthet Surg* 1998; 18: 36–37. PMID: 19328104
16. Orentreich DS. Subcision. In: Klein WK, editor. *Tissue augmentation in clinical practice*. New York: Marcel Dekker; 1998. p.173–190.
17. Orentreich DS, Orentreich N. Subcutaneous incision less (subcision) surgery for the correction of depressed scars and wrinkles. In: Harahap M, editor. *Surgical techniques for cutaneous scar revision*. New York: Marcel Dekker; 2000. p. 245–257.
18. Goodman G J. Therapeutic undermining of scars (subcision). *Australas J Dermatol* 2001; 42: 114–117.
19. Hexsel DM, Mazzuco R. Subcision: a treatment for cellulite. *Int J Dermatol* 2000; 39: 539–544.