

EFFICACY AND SAFETY OF CROSS TECHNIQUE WITH 100% TCA AND DERMAROLLER TECHNIQUE IN THE TREATMENT OF POST ACNE SCARS

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ABSTRACT

Objectives: To compare the effectiveness and safety of Dermaroller with TCA CROSS technique for the management of post acne scars.

Material and methods: This comparative study was conducted in Dermatology unit, Lady Reading Hospital Peshawar, Pakistan from April 2019 to December 2019. A total of 98 patients with post acne scars fulfilling the inclusion criteria were included in the study and were divided into two groups with 49 patients in each. Informed consent was taken. Patients of group 1 underwent four session of Dermaroller therapy while patients of group 2 were treated with 100% CROSS TCA with each session four weeks apart.

Results: A total of 98 patients were included in the study. Mean age was 29.55 year $\pm$ 5.0 SD. There were 30 (30.6%) male and 68 (69.4%) female patients. Forty two (42.9%) patients had ice pick scars, 38(38.8%) had box scar and 18(18.4%) patients had rolling type of acne scars. Efficacy of treatment in Group 1 was excellent in 15(30.6%) patients, 18 (36.7%) patients showed good response, 9(18.3%) patients showed fair and 7 (14.28%) patients showed poor response. While in group 2, 15(30.6%) patients showed excellent response, 16(32.65%) patients showed good, 13(26.5%) patients showed fair and 5(10.2%) patients showed poor response to treatment. There was no statistically significant difference found in the efficacy of treatment in both groups (p-value of 0.758).

Conclusion: Both the techniques i.e CROSS TCA and Dermaroller are effective and comparable in the treatment of post acne scars.

Keywords: CROSS TCA, Dermaroller, post acne scars, efficacy.

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INTRODUCTION

Acne vulgaris is a chronic disorder of pilosebaceous unit, which usually occurs in adolescent age group. The etiology of formation of atrophic acne scars is not completely understood.¹ There is no correlation between the incidence and severity of acne and the degree of scarring.^{2,3} That is the reason some patients of acne develop scars while other do not. Scarring can develop at any stage of acne and is usually permanent. It is generally understood that early treatment of inflammatory and nodulo-

cystic acne generally helps in preventing the development of post acne scarring.⁴⁻⁶ Post acne scars types are considered to be related to the severity of acne and the delay in intervention. They are classified into three types: Ice pick scars, box scars and rolling scars. Ice pick scars are less than 2mm in width, punctiform, 'v' shaped scars, with narrow infundibulum and wider opening. Rolling scars are distensible scars, with gentle slopping edges and centrally depressed. Boxcar scars are 'u' shaped punched out, shallow or deep scars that may be round, polygonal or linear.^{7,8} Atrophic acne scars have been treated by multiple treatment modalities. These include subcision, dermabrasion, ablative and non-ablative laser resurfacing techniques. These treatment modalities are associated with morbidity and longer downtime. They also are of no help in treating ice pick scars, which extend deeply into the dermis and sometimes to the subcutaneous tissues.⁹ Dermaroller and microneedling processes help in inducing the new collagen formation and thus help in treating acne

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scars. The standard dermaroller is a drum shaped rolling device which has 192 fine microneedles which are of different lengths (0.5-1.5 mm) with a diameter of 0.1 mm, they are arranged in eight rows.¹⁰ In procedure of TCA CROSS focal application for acne scars, trichloroacetic acid of 70% concentration is pressed hard with sharpened wooden applicator on the depressed area of atrophic acne scar.¹¹ As acne scars are polymorphic and different types of acne scars may be present in same patient at the same time, no single effective technique is available for the various types of scars, and so multiple techniques will be used in the same patient.¹² There is a need for the treatment options that are both effective and safe. The primary objective of this study was to compare the effectiveness and safety of Dermaroller with TCA CROSS technique for the management of post acne scars.

MATERIAL AND METHODS

The study was conducted in Department of Dermatology, Lady Reading Hospital Peshawar, from April 2019 to December 2019. Prior approval of hospital ethical committee was taken for the study. A total of 98 patients having post acne scars were included in the study. Lottery method was used to divide the patients into two groups, with 49 patients in each group. Patients on oral retinoids treatment, patients with active acne, patients with herpes labialis and keloidal tendency were excluded from the study. Written informed consent was taken from all the patients before the procedure. The grading of post acne scars was done clinically and by serial photographs before every treatment session. Group I patients underwent four sessions of dermaroller therapy four weeks apart. While using a Dermaroller for post acne scars, the device with needles of different lengths ranging from 1.5 to 2.5mm was rolled across the skin with pressure in multiple directions until the area showed pinpoint bleeding from multiple punctured sites. Prior to the treatment, topical anesthetic was applied for one hour. After the procedure, the area was cleansed with saline-soaked gauze and an occlusive ointment was applied. Group II patients were treated with four sessions of trichloroacetic acid CROSS technique four weeks apart. Topically, 100% TCA concentration was applied on the post acne scars area using a specially designed applicator. After CROSS technique, patients were advised to apply topical emollients in order to avoid drying effect of the procedure. Strict sun protection and application of sunscreen lotions were advised. The adverse effects were noted in both the groups. The improvement of the patients was categorized according to Quartile grading scale (table1)

RESULTS

A total of 98 patients were enrolled in the study. There were 30 (30.6%) male and 68 (69.4%) female patients as shown in table 2. Age range was from 20 to 39

years (table 3). Mean age was 29.55 (± 5.0) years. Maximum number of patients belonged to the age group of 25-29 years with female to male ratio of 2.2:1. Maximum number of patients in study had ice pick scars. A total of 42(42.9%) patients had ice pick scars, 38(38.8 %) had boxcar and 18(18.4%) patients had rolling type of acne scars (table 4).

Efficacy of treatment in Group 1 was excellent with >75% improvement in 15(30.6%) patients. 18 (36.7%) patients showed good response to the therapy, 9 (18.3%) patients showed fair and 7 (14.28%) patients showed poor response to treatment in group 1, as shown in table 3. On the other hand, 15(30.6%) patients in group 2 showed excellent response to treatment. 16(32.65%) patients showed good, 13(26.5%) patients showed fair and 5(10.2%) patients showed poor response to treatment in group 2 (table 5). There was no statistically significant difference in the efficacy of treatment in the two groups (p-value of 0.758). The most common side effect noted in patients after the both procedures was hyperpigmentation. Thirty five patients developed hyperpigmentation. Seventeen of them belonged to group 1 and 18 patients in group 2. Twenty two patients developed erythema with 16 patients treated with 100% TCS CROSS technique. Nineteen patients developed hypopigmentation which was more in group 2 patients. Seventeen patients had post procedure burning and stinging sensation, 4 patients had flare of herpes labialis. Only one patient had no side effects after the procedure in group 2, (table 6).

Table 1: Quartile grading scale for level of improvement of post acne scars.

Improvement level	Percentage of improvement
Excellent	>75%
Good	51-75%
Fair	26-50%
Poor	<25%

Table 2: Gender wise distribution of patients with post acne scars (n=98).

Gender	Frequency & % ages
Male	30(30.6%)
Female	68(69.4 %)
Total	98(100 %)

Table 3: Age wise distribution of patients with post acne scars (n=98).

Age in years	Frequency & % ages
20-24	15(15.3%)
25-29	41(41.8 %)
30-34	22(22.4 %)
35-39	20(20.4 %)
Total	98(100 %)

Table 4: Frequency and percentage of types of post acne scars in patients (n=98).

Scar type	Frequency & % ages
Ice pick scars	42(42.9 %)
Boxcar scars	38(38.8 %)
Rolling scars	18(18.4 %)

Table 5: Results of the study.

Efficacy	Group 1	Group 11	Total
Excellent>75%	15	15	30
Good 51-75%	18	16	34
Fair 26-50%	9	13	22
Poor <25%	7	5	12
P-value 0.758			

DISCUSSION

The treatment of post acne scars is a challenge. As post acne scars are polymorphic, their treatment required combination of many techniques in a single patient.^{13,14} The combination of techniques like subcision, punch excision, punch grafting, dermabrasion, chemical peels and ablative and non-ablative procedures are used for various types of post acne scars.^{6,15} The most difficult type of acne scar for treatment is ice pick scar, as it extends deep into the dermis and can reach upto subcutaneous tissue.¹⁶

A total of 98 patients having acne scars of different types were included in the study. In our study, the maximum number of patients belonged to the age group of 25-29 years which is consistent with the study conducted by Puri et al. Mean age of patients in our study was 29.5 ± 5 years, with female to male ratio in our study was 2.2:1, which was consistent with Puri et al in which female outnumbered males in the study.¹¹ In another study by Puri et al, the female to male ratio was also high.¹⁷

The treatment efficacy with 100% TCA CROSS technique was excellent in 30.6% in our study, while in Puri et al marked improvement was seen in 60% patients after 100% TCA CROSS technique. Similarly, 30.6% patients in group 2, treated with dermaroller in our study showed excellent response to treatment. In Puri et al, there was marked improvement in 40 % of the patients after the procedure of dermarolling in the post acne scars.¹¹ In study conducted by Agarwal N et al, the response to 70% TCS CROSS technique was more than 50% in 60% of the cases.¹⁸ Lehet et al showed that improvement was seen in all the patients enrolled in the study. The study showed that the response to treatment by dermarolling technique is more than in the group treated with TCA CROSS technique. Statistically, the response to treatment in both group was significant, but the level of improvement between the two groups was not significant. This was consistent with this study where the p-value was statistically insignificant

on stratifying the difference in the efficacy to the treatment in two groups.¹⁹

The efficacy of treatment by 70 % TCA CROSS technique was excellent in 15 (30.6%) of 49 patients. Lee et al reported good clinical response in 81% of patients with 65% TCA and 93% good clinical response in 93.7% of patients by using 100% TCA, which was contrary to our study where 36.7% patients showed good clinical response to treatment by 70% TCA Cross technique.² In a study conducted by Aust MC et al showed that response to 100% TCS CROSS applied twice at 12 weeks intervals in split face gave better response in ice pick scars.²⁰

Majid et al used the microneedling technique for treating the atrophic post acne scars. It was found that 80 % of patients assessed their treatment as excellent with this technique. In this study, however, 63% of the patients showed more than 50% improvement in their post acne scars after treatment with the dermarolling technique.²¹

Most common side effects in the study in both groups was hyperpigmentation (34.6%, 36.7%). This was followed by post procedural erythema (32.6%) in group 1 and hypopigmentation (30.6%) in group 2. In another study, maximum number of patients on treatment with TCA CROSS developed hyperpigmentation(13.3%), while 20% patients on dermaroller treatment developed erythema after the procedure. Transient erythema is one of the most common adverse effect of the procedure according to Iriarte et al.²² Pain and edema was present in only 6.7% cases.¹¹ Puri et al showed that only one patient developed hypopigmentation after the procedure which was again contrary to our study where 4 patients developed post procedural hypopigmentation.² Lee et al also shows that hypopigmentation is one of the significant side effect of the TCA peel used for treating post acne scars.²³

LIMITATIONS

In our study the sample size was small so further studies with large number of patients are indicated to validate the long term result of these techniques. These techniques were not applied on the patients having history of photosensitivity.

CONCLUSION

For the treatment of post acne scars, both CROSS TCA technique and Dermaroller are effective but CROSS TCA technique is minimally invasive and cost effective for the treatment of post acne scars. It has got lesser side effects as compare to Dermaroller. Beside these techniques there are many other ways to treat post acne scars but no single technique is fully effective. Therefore, multiple technique can be used to achieve the desired goal.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- Ullah I:** Study idea, concept, design and statistical analysis
- Paracha MM:** Study supervision and drafting and critical revision
- Zahoor H:** Data collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.