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A comparative examination of the microneedling plus subcision's efficacy in atrophic acne scars with and without 50% TCA cross

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Abstract
Background and Objective: To evaluate the added efficacy of 50% TCA CROSS in treating atrophic acne scars, study participants in one group underwent microneedling plus subcision using 50% TCA CROSS, whereas participants in a different group underwent microneedling plus subcision.
Method: In a randomised controlled open-labelled prospective study, microneedling, subcision, and 50% TCA CROSS were compared to microneedling and subcision alone on 80 patients attending the skin outpatient department of either sex.
Result: Among patients in grade 3, 30% in group 1 and 35% in group 2 exhibit a remarkable 2 Grade improvement in scar grade. Following therapy, 85% and 70% of grade 4 patients in groups 1 and 2, respectively, demonstrated an excellent improvement in scar grade.
Conclusion: Good results for grade 3 and 4 atrophic acne scars in group 1 and 4 was seen. Patients in both groups tolerated it well, with no failures. No significant difference was seen between the groups' improvements, casting doubt on 50% TCA CROSS's efficacy for atrophic acne scars. For a more complete assessment, more study with a larger sample size is needed. Patients can have less downtime and cost-effective treatment.

Keywords: Microneedling, atrophic acne scars, subcisions, patient satisfaction score

Introduction
As a result of propionibacterium acnes colonising follicles, increased sebum production, and abnormal follicular keratinization, acne vulgaris is a distinct chronic inflammatory syndrome affecting the pilo sebaceous follicular unit. From non-inflammatory comedones to inflammatory papules, nodules, pustules, and cysts, acne vulgaris can present in a variety of ways. These are primarily seen in seborrhoeic areas such as the face, upper chest, arms, and upper back [1, 2, 3]. While many cases of acne resolve on their own without any lasting effects, 20% of teenagers experience permanent psychological morbidity because to the pigmentary changes and scarring that follow inflammatory lesions.
Most notably for men, post-acne scarring causes severe psychological suffering and has even been linked to an increased risk of suicide. Most often, an inflammatory lesion causes scarring following acne. The length, intensity, and depth of the inflammation all affect how much scarring results. Thus, in order to prevent scarring, acne vulgaris must be treated promptly and effectively. A plethora of readily available topical and systemic medications have been created in recent years to effectively treat acne. While topical and systemic medications are highly effective in treating acne vulgaris, procedural methods are necessary for treating post-acne scarring. Acne scar treatment treatments include a variety of procedural choices. Three distinct procedural modalities are used in this study because there are many morphological forms of acne and they cannot all be treated with a single innovative modality [4, 5, 6].

Material and Methods
A study employing a randomised controlled open-labelled prospective design sought to compare the efficaciousness of microneedling, subcision, and 50% TCA CROSS as a combination therapy to those of microneedling and subcision alone. The study also assessed 50% TCA CROSS's possible added value in healing atrophic acne scars in participants who visited Madha medical college, Chennai, Tamil Nadu, India between March 2015 to February 2016. Following institutional ethical committee permission, 80 patients with Grade 2-4 atrophic acne scars in the 16–35 age range who were seeing the skin outpatient department for either sex were added to the study.

Inclusion criteria

- Adults who are 50 years of age or older
- Adults of any sex
- Patients with atrophic acne scar grades 2, 3, and 4 (Goodman and Baron acne scar grades)
- People ready to give informed consent

Exclusion criteria

- Patients with keloidal scarring or a tendency to develop bleeding disorders
- Patients receiving systemic or topical retinoids within the last six months
- Patients on corticosteroid therapy (Systemic or topical);
- Chronic skin disorders (Vitiligo, psoriasis, etc.) that were present before
- Active skin illnesses, such as warts, herpes, and bacterial infections
- Patients with systemic diseases, such as diabetes, ischemic heart disease, and systemic hypertension; pregnancy and breastfeeding; etc.

Results

Table 1: Gender distribution

Gender	Group 1 (%)	Group 2 (%)
Male	24 (60)	22(55)
Female	16 (40)	18(45)

Table 2: Result of after treatment in Grade 2 Patients

Initial grade	Final grade		No. of patients		%		p value
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	
2	0	0	0	0	0	0	0.725
2	2	2	6	8	100	100	
2	3	3	0	0	0	0	

Table 3: Result of after treatment in Grade 3 Patients

Initial grade	Final grade		No. of patients		%		p value
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	
3	0	0	0	0	0	0	0.815
3	2	2	7	5	37	32	
3	3	3	10	9	66	72	
3	4	4	0	0	0	0	

Table 4: Result of after treatment in Grade 4 Patients

Initial grade	Final grade		No. of patients		%		p value
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	
4	0	0	0	0	0	0	0.519
4	2	2	0	0	0	0	
4	3	3	9	7	85	79	
4	3	3	2	2	22	27	
4	4	4	0	0	0	0	

Table 5: End study patient satisfaction score

Patient satisfaction score	Group 1	Group 2
Good	16	18
Very Good	12	11
Excellent	5	5

Table 6: Improvement in Scar Grade after Treatment in Grade 2

Scar grade	Before treatment	After treatment
Grade 1	0	13
Grade 2	10	19
Grade 3	17	2
Grade 4	12	0

Chi square: 32.65 P value: 0.0001

Table 7: Acne Scar Grade after Treatment

Grade	Group 1		Group 2	
	No of patients	percentage	No of patients	Percentage
Grade 1	12	30	13	40
Grade 2	18	45	19	47.5
Grade 3	5	12.5	2	5
Grade 4	0		0	0

Chi square: 0.6 P value: 0.68

Discussion

A common and efficient first-line treatment for any atrophic scar, especially rolling scars, is subcision with a Nokor needle. Dermapen microneedling works well for rolling, boxcar, and icepick scarring. TCA CROSS works nicely on deep boxcar and deep pitted scars. Since atrophic acne scars can take many different forms, no one novel treatment works for everyone [7, 8]. Research supports the use of these methods in combination, treating all types of atrophic acne scars in our study. The results can be contrasted with those of previous studies that employed mixed approaches. 75 percent of the 60 patients in our study, with a mean age of 23, were between the ages of 21 and 30. Patients in Group 1 are primarily between the ages of 21 and 25, making up 77% of patients between the ages of 21 and 30. In contrast, 71% of patients in group 2 were between the ages of 21 and 30. In a research by Raza Hassan *et al*., the mean age of the patients was 25.07 years, and most of them were in the 26–30 year age range. Similarly, the mean age of patients in a study by Shilpa Garg *et al*. that comprised microneedling, 15% TCA peel, and subcision was 25.6 years [9, 10].

In Shashank Bhargava's study, which combined subcision and microneedling, the mean age was 24.2 years. 86 In each of our study groups, the majority demographic was 60% male. 37% of the people in group 1 were women and 63% were men. In group 2, there were 43% females and 57% males. A similar male preponderance was seen in the study of Raza Hasan *et al*., where 55% of the participants were men. In contrast, Shashank Bhargava and Shilpa Garg *et al*.'s investigations included roughly 60% female participants. In our study, out of sixty patients, 38.7% showed exceptional improvement in their scar grading. It shows that people improved by at least two grades following treatment. Group 1 had 45 percent of patients who showed significant improvement, while group 2 included 32.5% of patients who responded exceptionally well [11, 12]. This is similar to the combo experiment conducted by Shilpa Garg *et al*., which showed an amazing 34.6% improvement rate and comprised microneedling, subcision, and a 15% TCA peel. 52.6% of the subjects in our study responded favourably. These patients' scars had improved by one grade. 51.5% of patients in group 1 and 53.3% of patients in group 2 showed a good response. This is similar to a study by Shashank

Bhargava *et al*. that discovered 71% of patients responded favourably to a combination of subcision and microneedling [13, 14].

Every patient in our study had at least one grade improvement in their scars. All patients in both groups showed improvement by the end of the six sessions. This study is comparable to one by Shashank Bhargava *et al*., which shown a 95.6% improvement in scar at least by one grade. Because of this, from the start of our experiment, 100% of the subjects experienced some improvement in scarring. Compared to 63% of grade 2 and 75% of grade 3 patients who showed acceptable response, 78% of grade 4 patients in our study showed outstanding response. According to a study by Shilpa Garg *et al*., a 100% fantastic reply was shown in grade 2, 68.2% acceptable response in grade 3, and 62.5% superb response in grade 4. Both research groups underwent statistical analysis, and the qualitative results were compared between the groups [15, 16].

A statistically significant improvement in scar grade across all scar grades in group 1 both before and after therapy is indicated by a p value of less than 0.05, which was not seen in our study. Most patients in group 1 (65%) showed improvement only after two sessions of microneedling and two sessions of subcision with 50% TCA CROSS. Sixty percent of the patients in group 2 showed improvement only after receiving two sessions of subcision and microneedling. In two dermaroller and peel sessions and following subcision, scar healing was first observed, according to research by Shilpa Garg *et al*. Approximately 10.5% of the patients in our study claimed very good satisfaction at the end of the follow-up period, followed by 35.5% who reported very good pleasure, 43.7% who reported high satisfaction, and no patient who reported bad contentment. Treatment resulted in post-inflammatory hyperpigmentation in two patients in group 2 and three patients in group 1. Acne has gotten worse in six patients in group 1 and four patients in group 2 [17, 18].

The post-inflammatory hyperpigmentation in these patients subsided after three to four weeks. Patients experiencing an aggravation of acne were treated with 1% clindamycin cream topically and with doxycycline tablets until lesion 89 improved. Since the treatment, there have been no additional noteworthy adverse effects or limitations on daily activities. In a research by Shilpa Garg *et al*., three individuals (6% of the total) had worsening acne and transient post-inflammatory hyperpigmentation. Although assessing the reduction in acne scars was the main objective of our study, a few additional benefits were also mentioned by some of the patients, including reduced seborrhea in 7 and 5 of groups 1 and 2, and improved skin texture in 9 and 7 of groups 1 and 2 [19, 20].

Numerous research have employed subcision, microneedling, TCA CROSS, and fractional co2 either alone or in conjunction with other modalities. It proved how successful combination therapies are in repairing scars from atrophic acne. 100% TCA CROSS has been shown in numerous trials to be beneficial in healing atrophic acne scars; nevertheless, it is linked to significant downtime and post-inflammatory pigmentation. In light of the minimal downtime and minimal pigmentary effects associated with atrophic acne scars, we opted to employ 50% TCA CROSS. We assessed the advantages of 50% TCA CROSS in atrophic acne scars as well as the efficacy of combination therapy by combining it with subcision and microneedling, especially with dermapen, since a single modality is not very effective [20, 21, 22].

Conclusion

The morphology of scars left behind by post-atrophic acne varies. Atrophic acne scars can be treated with a wide range of energy- and non-energy-based methods. As there is an increasing need for highly cosmetic operations that are less invasive. In our study, we used minimally invasive techniques such as 50% TCA CROSS instead of 100% TCA CROSS, which has reduced downtime and minimal post-inflammatory pigmentation, and microneedling with a dermapen instead of a traditional dermaroller. This combo also includes subcision, which is the initial technique performed for atrophic acne scars prior to any additional procedure. In our investigation, very favourable outcomes were observed in both group 1 and group 4 for atrophic acne scars in grades 3 and 4. Patients in both groups handle this medication well; there are no failure rates or missed workdays as a result. Combination therapy, as opposed to unimodal therapy, is more successful in healing atrophic acne scars than unimodal therapy when it comes to the use of subcision and microneedling with and without 50% TCA CROSS. However, no statistically significant difference was observed between the groups' improvements, raising doubts about the effectiveness of 50% TCA CROSS for atrophic acne scars. Nonetheless, additional research with a bigger sample size is necessary for a more thorough assessment. The patient experiences minimum downtime, a high degree of patient satisfaction, and cost-effective treatment.

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Conflict of interest
Nil

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