

SKIN MICRONEEDLING PLUS SPOT TRICHLOROACETIC ACID PEEL IN THE TREATMENT OF ATROPHIC POST ACNE SCARS: COMPARATIVE SPLIT FACE STUDY

By

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ABSTRACT

Background: Post Acne scarring is an unfortunate and frequent complication of acne vulgaris that results in many psychological and emotional problems for patients and the families. Acne scarring may be either atrophic or hypertrophic. Atrophic acne scars are further subdivided morphologically into boxcar, icepick, or rolling scars.

Objective: To compare between the effect of microneedling using dermapen and microneedling plus medium depth chemical peeling using T.C.A 30% in post acne atrophic scars.

Patients and methods: This study was carried out on 30 patients with different clinical variants of atrophic post acne scars diagnosed clinically on the basis of typical appearance of skin lesions. Patients were recruited from Dermatology Department outpatient clinic in Al-Azhar University hospitals from April 2019 to December 2019. Their ages ranged from 18: 30 years.

Assessment of scars in both sides of face was done for their type, number, depth (severity) before and after each session and when the follow up period became completed (2 weeks after the last session). Digital Facial photographs for right and left sides of the face were obtained before treatment, during each session, and when the follow up period became completed (2 weeks after the last session).

Results: Most of the patients (60%) achieved marked improvement, 30% achieved good improvement and 10% achieved excellent improvement on the left side of the face, while on the right side of the face most of patients (73.3%) achieved good response and 26.7 % achieved poor response.

The mean percentage of improvement of the left side was 55.5 %, while the percentage of improvement of the right side was 33%.

Conclusion: Automated microneedling (Dermapen) and T.C.A 30% chemical peel were minimally invasive simple, cheap and effective techniques in the treatment of post acne atrophic scars and improved skin homogeneity and texture. Microneedling plus spot T.C.A 30% have the advantage of rapid healing, short down time, eliminating most of risks and negative side-effects of laser resurfacing or cross technique. The treatment can be performed in an office setting and did not need any extensive special training or expensive instruments and can be used for rejuvenation of the skin, remodeling of the scar. Combination of automated microneedling with other modalities as spot T.C.A 30% for the treatment of post acne atrophic scars gave better results than the use of single modality of treatment as microneedling alone.

Key words : microneedling , post-acne sars , trichloroacetic acid

INTRODUCTION

Post acne scarring defined as replacement of normal tissue destroyed by inflammatory process of acne by fibrous tissue. During the process of wound healing if there is absence of production of collagen, acne scars occurs (*Lee et al., 2011*). It is an unwanted end point of acne that is related to the severity of inflammation and delayed beginning of effective treatment (*Wollina and Godman, 2015*). It is often associated with physical and psychological distress, reduction of self-esteem life quality (*Faghihi et al., 2015*). Several therapeutic options are currently available for atrophic acne scars treatment (*Fife, 2011*) including chemical peeling, dermabrasion, laser treatment, scar subcision, punch techniques, fat transplantation or other tissue augmenting agents the choice of treatment modality often based on scar type.

Skin microneedling is a method for transdermal collagen induction therapy that is also call needle dermabrasion. Microneedling is a relatively a new minimally invasive procedure that involves superficial and controlled puncturing of the skin by rolling miniature fine needles. Over a short period of time, it has gained mass popularity and acceptance as it is effective, safe, simple, cheap technique requiring minimal training. Traditionally used as a collagen induction therapy for skin rejuvenation and facial scars, it is also widely used now as a transdermal delivery system for therapeutic drug and vaccines (*Singh and Yadav, 2016*).

Mechanism of action of skin microneedling is penetration of the superficial skin layer occurs with its

destruction. This leads to growth factors release that stimulates new collagen, elastin and new capillaries formation in the papillary dermis there for the name percutaneous collagen induction therapy. This neocollagenesis and neovascularization following treatment leads to reduction of scars (*Doddaballapur, 2009*). The old collagen strands that tether the bed of the scar in the most superficial layer of the dermis become broken by the needles; stimulate removal of destructed collagen, and more collagen deposition immediately under the epidermis. Ideally, we need to get effects in the reticular dermis to enhance the collagen deposition and elastin fibers (*Fernandes and Signorini, 2008*). The production of a new collagen occurs slowly, so the improvement start to appear after six weeks, but the full response can take at least 12 weeks. Improvement of the skin texture will continue for about one year. Rolling acne scars and superficial boxcar scars show good response to skin microneedling (*Gozali and Zhou, 2015*).

Chemical peeling is a widely used procedure in the management of acne and acne scars. It cause controlled destruction of a part or the entire epidermis, with or without the dermis, leading to exfoliation and removal of superficial lesions, followed by regeneration of new epidermal and dermal tissues.

Trichloroacetic acid is an established peeling agent which is mostly used for superficial as well as medium depth peel.

The aim of this study was to compare between the effect of microneedling using dermapen and microneedling plus medium

depth chemical peeling using T.C.A 30% in post acne atrophic scars.

PATIENTS AND METHODS

This study was carried out on 30 patients with different clinical variants of atrophic post acne scars diagnosed clinically on the basis of typical appearance of skin lesions. Patients were recruited from Dermatology Department outpatient clinic in El-Azhar University hospital. From April 2019 to December 2019. Their age ranged from 18:30 years.

All patients were subjected to the following:

Assessment of scars in both sides of face was done as for their type, number, depth (severity) before and after each session and when the follow up period become completed (2 weeks after the last session).

Digital Facial photographs for right and left sides of the face were obtained before treatment, during each session, and when the follow up period become completed (2 weeks after the last session).

Patients gave informed consent to participate in this work. Participants had complete explanation about the nature, risks and purpose of the study.

The observer used Goodman's Qualitative grading system of post acne scarring (*Fabbrocini et al., 2012*). According to this classification for response to treatment for each patient three dermatologists compare before treatment and after treatment digital photographs, number, type and the grade of acne scar. Scoring of post acne scars before and after treatment by dermatologist following the weighted

scale; 3 points for deep, 2 points for shallow scars and 1 point for superficial scars (*Lipper and Perez, 2005*).

Dermapen was set at 2mm and the scar was treated with circular motion. Then horizontally and then vertically eight times. Blood was wiped away with sterile gauze and the skin washed with sterile saline.

Spot TCA 30% was applied to the left side of the face immediately after micro needling session. TCA 30% was applied to the interior of the scars using toothpick till appearance of white frost. After appearing of the frost the neutralizer was applied, this creates a foaming reaction, the neutralizer was applied continuously till all foaming ceases. Topical antibiotic was placed on each treated sites.

Assessment of the efficacy of the therapeutic procedure:

To record percentage of improvement for each patient regarding severity grading, skin texture comparing before and after digital photographs. Finally, the minimum rate on which both investigators agreed was considered as investigators' view in the study, and a quartile grading scale was used (*Weiss et al., 2010*) as following:

No to mild improvement 0 -25 %, Mild improvement <25%, Good improvement 25-50%, Very good improvement 51-75%, Excellent improvement > 75%.

Patient satisfaction:

The degree of improvement according to patient opinion was evaluated. At the last visit, the patient was asked about his satisfaction degree about the results comparing with the pre-treatment

condition of both sides, patients were asked to fill up a questionnaire about their satisfaction using the following grades: Excellent, good, poor and fair

Safety assessment:

For assessment of safety of derma pen any side effects were recorded. These side effects included inflammation and hyperpigmentation.

Statistical analysis:

Data were analyzed using Statistical Program for Social Science (SPSS) version 24. Quantitative data were expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage.

Chi-square test was used when comparing between non-parametric data.

P-value < 0.05 was considered significant.

RESULTS

The male to female ratio was 8:7. There were 63.3% (19 patients) of the patients below the age of 25 and 36.7% (11 patients) above the age of 25.

According to skin phenotype, 3 cases (10%) of type II, 23 patients (76.6%) of type III and 4 patients (13.35%) of type VI in the studied patients (**Table 1**).

Table (1): Description of personal data in all studied patients

Personal data		Studied patients (N = 30)	
Age (years)	Mean \pm SD	23.9 \pm 3.7	
	Min – Max	18 – 30	
Sex	Male	16	53.3%
	Female	14	46.7%
Duration (years)	Mean \pm SD	4.2 \pm 2.9	
	Min – Max	1 – 12	
Skin type	II	3	10%
	III	23	76.7%
	IV	4	13.3%

Regarding site, all treated scars were found on either or both cheeks with different sizes.

Grading severity of post acne scars was done according to Lipper and Perez (2005) and Goodman's quantitative global acne scarring grading system. Before treatment, there was 11 cases (36.7%) on the left side of the face and 10 cases on the right side of the face (33.3%) of mild grade II. 13 cases (43.3%) on the left side

and 16 cases (53.3%) on the right side of moderate grade III. 6 cases (20%) on the left side of the face and 4 cases (13.3%) on the right side of the face of severe grade VI. However, after the treatment there was 19 cases (63.3%) on the left side of the face and 7 cases (23.3%) on the right side of the face of macular grade I. 10 cases (33.3%) on the left side and 22 cases (73.3%) on the right side of mild grade II. 1 case (3.3%) on the left side of

the face and 1 case (3.3%) on the right side of the face of moderate grade III. There was no statistical significant difference between right and left sides as regard grading of scars before treatment

but after the treatment there was statistically significant difference between right and left sides as regard grading of scars (Table 2).

Table (2): Comparison between grading of scars (before and after treatment) in both right and left sides

Grading of scar		Before (N = 30)		After (N = 30)		X ²	P-value
Grading in left side	I	0	0%	19	63.3%	35.3	< 0.001HS
	II	11	36.7%	10	33.3%		
	III	13	43.3%	1	3.3%		
	IV	6	20.0%	0	0%		
Grading in right side	I	0	0%	7	23.3%	28.7	< 0.001HS
	II	10	33.3%	22	73.3%		
	III	16	53.3%	1	3.3%		
	IV	4	13.3%	0	0%		

Regarding patient satisfaction, 1 patient (3.3%) showed poor satisfaction, 6 patients (20%) showed fair satisfaction, 11 patients (36.7%) showed good satisfaction and 12 patients (40%) showed excellent satisfaction on the left side of the face. On the right side of the face 9 patients (30%) showed poor satisfaction, 7 patients

(23.3%) showed fair satisfaction, 9 patients (30%) showed good satisfaction and 5 patients (16.7%) showed excellent satisfaction. There was statistically significant difference (p-value < 0.05) between right and left side as regard patient satisfaction (Table 3).

Table (3): Comparison between right and left sides as regard patient satisfaction

side \ Patient satisfaction	Left side (N = 30)		Right side (N = 30)		X ²	P-value
Poor	1	3.3%	9	30%	9.55	0.023 S
Fair	6	20%	7	23.3%		
Good	11	36.7%	9	30%		
Excellent	12	40%	5	16.7%		

Regarding percentage of improvement obtained by 2 reviewers (Dermatologist), there was a statistical significant

difference (p-value < 0.001) between right and left sides of the face (Table 4)

Table (4): Comparison between right and left sides as regard % of improvement

side \ Improvement	Left side (N = 30)	Right side (N = 30)	T	P-value	
Reviewer 1	Mean	54.3	34	5.7	< 0.001 HS
	±SD	15.2	12.2		
Reviewer 2	Mean	50.5	32	4.67	< 0.001 HS
	±SD	17.8	12.4		

Regarding safety, the patients reported transient erythema and edema which resolved 2 days later. 18 patients (60 %) showed minimal inflammation, 10 patients (33.3%) showed mild inflammation and 2 patients (6.7%) showed moderate inflammation of the left side of the face after the sessions. On the right side of the face, 18 patients (60%) showed minimal inflammation, 11 patients (36.7%) showed mild inflammation, and 1 patient (3.3%) showed moderate inflammation after the session. There was no statistical difference between left and right side of the face as regard inflammation after the session.

As regard post session hyperpigmentation 17 patients (56.7%)

showed minimal hyperpigmentation, 11 patients (36.7%) showed mild hyperpigmentation and 2 patient (6.7%) showed moderate hyperpigmentation of the left side of the face after the sessions. On the right side of the face 25 patients (83.3%) showed minimal hyperpigmentation, 4 patients (13.3%) showed mild hyperpigmentation and 1 patient (3.3%) showed moderate hyperpigmentation after the session. There was no statistical difference between left and right side of the face as regard hyperpigmentation after the session (**Table 5**)

Table (5): comparison between right and left sides as regard Complications

Side		Left side (N = 30)		Right side (N = 30)		X ²	P-value
Complications							
Inflammation	Minimal	18	60%	18	60%	0.38	0.827
	Mild	10	33.3%	11	36.7%		
	Moderate	2	6.7%	1	3.3%		
Hyperpigmentation	Minimal	17	56.7%	25	83.3%	5.12	0.077
	Mild	11	36.7%	4	13.3%		
	Moderate	2	6.7%	1	3.3%		

Regarding Quantitative numeric scoring system according to *Lipper and Perez (2005)* based on lesion counting and giving 1 point for superficial scar, 2 points for shallow scars and 3 point for deep scars, there was no statistically significant difference between both sides of the face before the treatment (p-value > 0.05) (Table 6), while after the treatment there

was a statistically significant difference (p-value < 0.001) between both sides (**Table 7**).

Both side of the face showed statistically significant difference (p-value < 0.001) after treatment according to Lipper and Perez score system (**Table 8 and 9**).

Table (6): Comparison between right and left sides as regard Lipper and Perez 2005 score before treatment

Side		Left side (N = 30)	Right side (N = 30)	MW	P-value
Before treatment	Median	6	6	375	0.263
	IQR	0 – 7	4 - 7		
Superficial	Median	25	22	369.5	0.232
	IQR	22 – 29.5	20 – 28		
Shallow	Median	25.5	24	434.5	0.818
	IQR	15.75 – 38.25	18 – 33		
Deep	Median	54.5	50	404.5	0.501
	IQR	45.5 – 67.75	44.25 - 62		
Total	Median	54.5	50	404.5	0.501
	IQR	45.5 – 67.75	44.25 - 62		

Table (7): Comparison between right and left sides as regard Lipper and Perez 2005 score after treatment

Side		Left side (N = 30)	Right side (N = 30)	MW	P-value
After treatment	Median	5	6	408	0.532
	IQR	3.25 – 9	4 – 8.75		
Superficial	Median	12	16	223.5	0.001
	IQR	9.5 – 15	12 – 19.5		
Shallow	Median	6	16.5	259.5	0.004
	IQR	0.75 – 12.25	6 – 21		
Deep	Median	23	34.5	207	<0.001
	IQR	17.5 – 33.5	30 – 42.5		
Total	Median	23	34.5	207	<0.001
	IQR	17.5 – 33.5	30 – 42.5		

Table (8): Comparison of Lipper and Perez 2005 score (before & after) in Left side

Score		Before (N = 30)	After (N = 30)	MW	P-value
Left side	Median	6	5	372	0.246
	IQR	0 – 7	3.25 – 9		
Superficial	Median	25	12	64	< 0.001
	IQR	22 – 29.5	9.5 – 15		
Shallow	Median	25.5	6	154	< 0.001
	IQR	15.75 – 38.25	0.75 – 12.75		
Deep	Median	54.5	23	74.5	< 0.001
	IQR	45.5 – 67.75	17.5 – 33.5		
Total	Median	54.5	23	74.5	< 0.001
	IQR	45.5 – 67.75	17.5 – 33.5		

Table (9): Comparison of Lipper and Perez 2005 score (before & after) in Right side

Score		Before (N = 30)	After (N = 30)	MW	P-value
Right side	Median	6	6	418.5	0.639
	IQR	4 – 7	4 – 8.75		
Superficial	Median	22	16	170.5	< 0.001
	IQR	20 – 28	12 – 19.5		
Shallow	Median	24	16.5	240	0.002
	IQR	18 – 33	6 – 21		
Deep	Median	50	34.5	187	< 0.001
	IQR	44.25 – 62	30 – 42.5		
Total	Median	50	34.5	187	< 0.001
	IQR	44.25 – 62	30 – 42.5		

Regarding percentage of improvement, most of the patient (60%) achieved marked improvement, 30% achieved good improvement and 10% achieved excellent improvement on the left side of the face, while on the right side of the face most of

patients (73.3%) achieved good response and. 26.7 % achieve poor response.

The mean percentage of improvement of the left side was 55.5 %, while the percentage of improvement of the right side was 33%.

DISCUSSION

The results of the present study revealed that the percentage of improvement, most of the patient (60%) achieve marked improvement, 30% achieve good improvement and 10% achieve excellent improvement on the left side of the face, while on the right side of the face most of patients (73.3%) achieve good response and. 26.7 % achieve poor response.

sessions of micro needling using derma roller with an 8week interval.

Fabbrocini et al. (2012) and *Nofal et al. (2014)* who tried combined skin needling and PRP for treatment of atrophic post acne scars. PRP was applied topically to the treated area, followed by needling the skin using the needling tool (Derma Roller). So, Skin needling was shown to work well in combination with other treatments for acne scarring.

The mean percentage of improvement of the left side is 55.5 %, while the percentage of improvement of the right side is 33%.

Also *Alam et al. (2014)* who reported some improvement in acne scars after three needling sessions. There is a statistically significant improvement in such scars in the treatment group from baseline to 6 months and no significant improvement during this period in the control group. Participants perceived a 41% mean improvement in overall scar appearance on the treated side.

These results were in agreement with *Sharad (2011)* who compared skin needling to the combination of skin needling alternating with 35% glycolic acid (GA) peels. The combination treatment resulted in a statistically significant greater mean improvement the mean improvement in scars in Group (A) was 31.33%, while in group (2) it was found to be 62%.

One theoretic advantage of needling with spot T.C.A (30%) compared with fractional laser or cross technique is to have a lesser risk of pigmentation changes and inflammation especially in patients with Fitzpatrick skin type III or greater.

Leheta et al. (2011) used skin needling and 20% TCA (group 1), fractional thermolysis (group II), or a combination of both treatments (group III) mean severity scores of 60%, 62%, and 78%, respectively.

Fabbrocini et al. (2009) found that the severity of the acne scars in all patients was greatly reduced after only two

CONCLUSION

Automated microneedling (Dermapen) and T.C.A 30% chemical peel are a minimally invasive simple, cheap and effective technique in the treatment of post acne atrophic scars and improve skin homogeneity and texture. Microneedling plus spot T.C.A 30% have the advantage

of rapid healing, short down time, eliminating most of risks and negative side-effects of laser resurfacing or cross technique. The treatment can be performed in an office setting and does not need any extensive special training or expensive instruments. Can be used for rejuvenation of the skin, remodeling of the scar. Combination of automated microneedling with other modalities as spot T.C.A 30% for the treatment of post acne atrophic scars give better results than the use of single modality of treatment as microneedling alone.

REFERENCES

1. **Alam M, Han S, Disphanurat W (2014):** Efficacy of a Needling Device for the treatment of Acne Scars A Randomized Clinical Trial. *JAMA Dermatol* , 150(8):844-849.
2. **Doddaballapur S. (2009):** Microneedling with Dermaroller, *Cutan Aesthet Surg* , 2(2): 110-111.
3. **Fabbrocini G, Fardella N and Monfrecola A. (2009):** Acne scarring treatment using skin needling. *Br Association of Dermatologists Clinical and Experimental Dermatol* ., 34: 874-879.
4. **Fabbrocini G, Vita V D, Cozzolino A (2012):** The Management of Atrophic acne Scars: Overview and New Tools. Fabbrocini et al. *J Clin Exp Dermatol Res* ., 2012, S: 5.
5. **Faghihi G, Nouraei S and Asilian A (2015):** Efficacy of Punch Elevation Combined with Fractional Carbon Dioxide Laser Resurfacing in Facial Atrophic Acne scarring: A Randomized Split-face Clinical Study, *Indian J Dermatol* ., 60(5):473-478.
6. **Fernandes D and Signorini M. (2008):** Combating photoaging with percutaneous collagen induction. *Clinics in Dermatol* ., 26: 192-199.
7. **Fife D. (2011):** Practical evaluation and management of atrophic acne scars: tips for the general dermatologist. *J Clin Aesthet Dermatol* ., 4:50-57.
8. **Goza M V and Zhou B. (2015):** Effective Treatment of Atrophic Acne Scars. *J Clin Another Dermatol* ., 8(5):35-40.
9. **Lee W J, Jung H J and Lim H J (2011):** Serial sections of atrophic acne scars help in the interpretation of microscopic findings and the selection of good therapeutic modalities". *J of the Euro Acad of Dermatol and Vener*, 27(5):643 646.
10. **Lehata T, El tawdy A, Abdel hay R and Farid S. (2011):** Percutaneous Collagen Induction Versus Full-Concentration Trichloroacetic Acid in the Treatment of atrophic Acne Scars. *Dermatol Surg* ., 37:207-216.
11. **Liper G M and Perez M. (2005):** Nonablative acne scar reduction after series of treatment with short pulsed 1.064nm neodymium:YAG laser".*Dermatol Surg* ., 32(8): 998-1006.
12. **Nofal E, Helmy A, Nofal A, Alakad R and Nasr M. (2014):** Platlet-rich plasma versus cross technique with 100% trichloroacetic acid versus combined skin needling and platlet rich plasma in the treatment of atrophic acne scars. *Dermatol Surg* ., 40: 864-873.
13. **Sharad J. (2011):** Combination of microneedling and glycolic acid peels for the treatment of acne scars in dark skin. *J Cosmet Dermatol* ., 10:317-23.
14. **Singh A and Yadav S. (2016):** Microneedling: Advances and widening horizons. *Indian Dermatol Online J*, 7(4):244-254.
15. **Weiss, Anne Chappas and Lori Brightman (2010):** successful treatment of atrophic postoperative and traumatic scarring with carbon dioxide ablative fractional resurfacing. *Dermatol* ., 146(2):133-140.
16. **Wollina U and Goldman A (2015):** Fillers for the improvement in acne scars. *Clin Cosmet Investig Dermatol* ., 8: 493-499.

مقارنة بين تثقيب الجلد بالابر الدقيقة مع التقشير الكيميائي باستخدام حمض ثلاثي الكلوروأسيك في علاج الندبات الضامرة الناجمة عن حب الشباب (دراسة مقارنة)

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خلفية البحث: الندبات الناتجة عن حب الشباب هو من المضاعفات المعتادة لحب الشباب والتي تؤدي الى مشاكل نفسية لدى المرضى وعائلاتهم. هناك الكثير من طرق العلاج متاحة لعلاج الندبات الضامرة ما بعد حب الشباب مثل التقشير الكيميائي وتقنية الليزر وتثقيب الجلد بالابر الدقيقة.

الهدف من البحث: مقارنة تثقيب الجلد بالابر الدقيقة مع التقشير الكيميائي باستخدام حمض ثلاثي الكلوروأسيك في علاج الندبات الضامرة الناتجة عن حب الشباب.

المرضى وطرق البحث: هذه الدراسة هي تجربة سريرية عشوائية أقيمت على ثلاثين مصابا بالندبات الضامرة الناتجة عن حب الشباب من المترددين على عيادة الأمراض الجلدية بمستشفى الحسين الجامعي، وقد أجري لكل المشاركين فى التجربة لتقصي التاريخ المرضي كاملا وفحص أكلينكى عام قبل الجلسات وبعد كل جلسة وبعد أسبوعين من انتهاء الجلسات مع أخذ صور فوتوجرافية قبل الجلسات وبعد كل جلسة وبعد أسبوعين من انتهاء الجلسات وقد تم اختيار المرضى الذين تراوحت أعمارهم من 18 إلى 30 سنة وتم عمل ستة جلسات لكل مريض بفارق أسبوعين بين كل جلسة والأخرى كما تم عمل تثقيب للجلد بالابر الدقيقة فقط على الجانب الأيمن من الوجه بينما تم عمل تثقيب للجلد بالابر الدقيقة ثم تقشير كيميائي للندبات على الجانب الأيسر من الوجه.

نتائج البحث: الجمع بين تثقيب الجلد بالابر الدقيقة مع التقشير الكيميائي فى علاج الندبات الضامرة الناتجة عن حب الشباب أظهر نتائجاً واعدة مقارنة بتقنية تثقيب الجلد خاصة أن تطبيق ذلك العلاج المجمع سهل بدون ألم أو آثار جانبية نظراً لانه علاج موضعي وكذلك زيادة رضاء المصابين عن النتيجة.

الاستنتاج: تثقيب الجلد الآلي باستخدام جهاز قلم الجلد والتقشير الكيميائي باستخدام حمض ثلاثي خلات الكلور هي تقنية بسيطة ورخيصة وفعالة في علاج ندبات ما بعد حب الشباب الضار وتحسين تجانس الجلد والملمس وقد تميز تثقيب الجلد الآلي باستخدام جهاز قلم الجلد والتقشير الكيميائي باستخدام حمض ثلاثي خلات الكلور بميزة الشفاء السريع، وقت التعطل القصير، مما يلغي معظم المخاطر والآثار الجانبية السلبية لإعادة تسطیح الجلد بالليزر، يمكن إجراء العلاج في العيادات ولا يحتاج إلى أي تدريب خاص واسعة النطاق أو أدوات باهظة الثمن ، يمكن استخدامها لتجديد شباب الجلد، مزيج من تثقيب الجلد الآلي مع طرائق أخرى مثل التقشير البقعي باستخدام حمض ثلاثي خلات الكلور لعلاج ندبات ضامرة ما بعد حب الشباب تعطي نتائج أفضل من استخدام طريقة واحدة من العلاج مثل تثقيب الجلد الآلي وحده.