

## A SPLIT FACE COMPARATIVE STUDY TO EVALUATE THE EFFICACY OF SUBCISION VERSUS SUBCISION FOLLOWED BY PRP IN MANAGING ACNE SCARS

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Received : 01/02/2024  
Received in revised form : 07/04/2024  
Accepted : 24/04/2024

**Keywords:**

Platelet rich plasma, Subcision, Acne vulgaris, Scar.

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DOI: 10.47009/jamp.2024.6.2.206

Source of Support: Nil,

Conflict of Interest: None declared

*Int J Acad Med Pharm*

2024; 6 (2); 1019-1025

### Abstract

**Background:** Acne vulgaris is a chronic inflammatory disease affecting 85 to 90% of the adolescents and nearly three fourth of the affected patients end up with facial scarring. Autologous platelet rich plasma is considered as a novel treatment for acne scar management and as adjuvant in the acne scar revision procedures. Thus this split face study was done to compare the efficacy of subcision alone versus subcision followed by platelet rich plasma injection in managing patients with atrophic acne scars. **Material and Methods:** The study was conducted in the Department of Dermatology in Government Rajaji Hospital, Madurai Medical college. The study was done for a period from June 2020 to May 2021. 15 study participants recruited based on inclusion and exclusion criteria. Right side of the face-Subcision alone and in Left side of the face-Subcision followed by PRP was done. A predesigned proforma was used to collect the clinical details of the patients which included the age of the patient, age of onset of acne, history of inflammatory acne lesions in the past, history of keloidal tendencies and previous treatment taken for the same. Complete medical history and physical examination was done to ensure the eligibility criteria. Pre-treatment gradings of scars by Goodman and Baron Quantitative assessment grading was done and matched for both sides of the face. Dermatology life quality index (DLQI) was calculated using a predesigned questionnaire. Data collected were entered in MS Excel and the statistical analysis was done in SPSS 23. p value <0.05 was considered as statistically significant. **Results:** Majority of the study participants 9 out of 15(60%) were in the age group of 21-25 years. There was a male preponderance 10 out of 15(66.7%) in our study. 4 out of 15 (26.7%) participants were students. 10 out of 15(66.7%) had past history of inflammatory acne lesions. 80% of the study participants had mixed scars on both sides of face with more than one morphological subtype. Predominant scar type on both sides of the face was rolling scars in 10 patients (66.7%) and box scars in 5 patients (33.3%). Some improvement in scars on the right side of face were subcision alone was done was seen in 9 patients (60%) only after second sitting and 3 patients (20%) after third sitting whereas on the left side of the face were Subcision with PRP was done, 4(26.67%) showed improvement after first sitting itself, 10(66.6%) after second sitting. Subcision with prp on the left side of the face took an average of 1.8 sittings to bring some improvement in acne scar grade whereas subcision alone on the right side of the face took an average of 2.27 sittings. All the patients who had a very large effect on their quality of life before treatment had a better quality of life at the end of the treatment. 50% of the patient had good satisfaction at the end of the treatment. Post procedural side effects like mild pain, erythema, edema were seen in all patients immediately after procedure on both sides of the face. No additional side effects were noted with combining pro injection. **Conclusion:** Our study concluded that subcision combined with PRP (Platelet rich plasma) showed better results and earlier response than subcision alone in



the treatment of acne scars. It is also cost effective. No additional side effects were observed while combining PRP. Thus PRP can be used as an adjunct to subcision for managing acne scars.

## INTRODUCTION

Acne vulgaris is a chronic inflammatory disorder which may present as comedones, papules, pustules, nodules and cysts. The prevalence of Acne was over 90% among adolescents and 12%-14% of cases persist into adulthood.<sup>[1]</sup> 75% of patients with acne end up with scarring.<sup>[2,3]</sup> Irreversible scarring is one of the most common consequences which have a negative impact on emotional and mental health with economic drawbacks.<sup>[4]</sup>

Acne scars are categorized into hypertrophic, atrophic and keloidal. Most of the scars are Atrophic 75%. Ice pick scars, boxcar scars and rolling scars are included in atrophic scars and are name based on their morphology.<sup>[5]</sup> The scars which are narrow of diameter less than 2 mm and sharply margined tracks extending vertically to deep dermis are known as Ice pick scars. The scars which are wider and 4-5 mm with dermal tetherings are called Rolling scars. 1.5 mm to 4 mm width oval and round depressions with sharply demarcated vertical edges which can be shallow or deep are known as Box scars.<sup>[6]</sup>

Several considerations should be done for treating acne scars like severity of scarring, efficacy, physician goals, cost of treatment, patient expectations, side effects, psychological and emotional impact of the patient. Various treatment modalities are available for acne scars. They include chemical peels, subcision, microdermabrasion, dermaabrasion, skin microneedling, TCA Cross, punch grafts, punch excision, punch floats, infrared pulse light, nonablative radiofrequency, gelatine matrix implants and fractional laser resurfacing etc. Of all these, analogous platelet rich plasma (PRP) is considered as a novel treatment for acne scar management. It can be used as adjuvant for all the above mentioned treatment modalities. It has angiogenic properties and tissue remodelling and thus it reduces the total number of sittings required and the cost of the treatment. Thus this study was done to compare the efficacy of subcision alone versus subcision followed by platelet rich plasma injection in managing patients with atrophic acne scars in a split face study.

### Objectives of the Study

- To assess the morphological types of acne scars and pretreatment grade of the scars on both sides of the face.
- To perform subcision alone on right side of the face and subcision followed by PRP injection on the left side of face as a split face procedure in the study participants.
- To compare the efficacy between subcision alone and subcision combined with PRP in managing atrophic acne scars.

## MATERIALS AND METHODS

### Study Setting

This study was conducted in the Department of Dermatology, Government Rajaji Hospital, Madurai Medical college among the patients attending dermatology OPD. The study was done for a period from June 2020 to May 2021.

### Study Design

Non randomized prospective comparative study

### Inclusion Criteria

- All patients in the age group 15-30 years with both sexes
- Post acne scar patients with U (box scar), V (ice pick scar) and W(rolling) type
- Patients who gave consent for the procedure and for taking photographs
- Patients who were willing for follow up

### Exclusion Criteria

- Patients who did not give consent
- Acne scars others than U (box scar), V (ice pick scar) and W(rolling) type
- Pregnant or lactating women
- Patients with keloidal tendencies
- Patients with bleeding dyscrasias
- Patients with active acne or active infection at the procedure site

### Sample Size

The study participants fulfilling the inclusion and the exclusion criteria were included in the study throughout the study period. The final attained sample was 15.

### Data Collection Method

After obtaining the Institutional Ethical Committee clearance, the study was started. Based on inclusion and exclusion criteria the study participants recruited during the study period was 15. Routine preprocedure screening and relevant investigations were done before the split face study.

A predesigned proforma was used to collect the clinical details of the patients which included the age of the patient, age of onset of acne, history of inflammatory acne lesions in the past, history of keloidal tendencies and previous treatment taken for the same.

Complete medical history and physical examination was done to ensure the eligibility criteria. Pre-treatment gradings of scars by Goodman and Baron Quantitative assessment grading was done and matched for both sides of the face. Dermatology life quality index (DLQI) was calculated using a predesigned questionnaire. Entire procedure and risk benefits were explained to the patients in their own language and their consent obtained both verbally and written.

## Procedure

On the day of the procedure, preprocedure photographs were taken. Split face study with subcision alone on right half of the face and Subcision followed by PRP injection on the Left half of the face was performed for the study participants. The procedure was repeated every 4 weeks until the scar grade became 1 or up to a maximum of 4 sittings, whichever was earlier. Serial photographs were taken and acne scar grading was done on both sides of the face before each sitting. Subjects were followed up for a period of 6 months after the end of treatment.

## Statistical Analysis

The obtained data was entered in MS Excel Windows 10. Statistical analysis was done with the help of SPSS 23. Continuous data was expressed in terms of mean and standard deviation. Categorical data was expressed in terms of Numbers and Percentages. Test of association for Categorical data was Chi square test and for Continuous data was t test and Anova test. p values <0.05 is considered as statistically significant.

## RESULTS

Majority of the study participants were in 21-25 years 9(60%) of age in adults followed by 26-29 years 3(20%). Male preponderance were more in our study 10(66.7%). Most of the study participants were students 4(26.7%) followed by unemployed persons 3(20%). [Table 1]

10(66.7%) of the study participants had past history of inflammatory acne lesions. 80% of the study participants had mixed scars with more than one morphological subtype. Difference in morphology of scar may influence the study outcome of a split face study. Hence the patients were selected such that the predominant scar type on both Right and left sides were same. 10 (66.7%) had rolling scars as the predominant scar type on both sides of the face and 5(33.3%) had box scar as the predominant scar type on both sides of the face. [Table 2]

Pretreatment scar grading showed 7 (46.7%) study participants had grade 3 acne scars, 5(33.3%) had Grade 2 acne scars and 3(20%) had grade 4 acne scars on the right side of the face. 6(40%) study participants had Grade 3, 6(40%) had Grade 2 and 3(20%) had grade 4 acne scars on the left side of the face. The patients were selected such that the mean baseline scar grade was found to be 2.80 on both sides of face. [Table 3]

In our study, post treatment improvement by 1 grade from baseline was taken as good response and improvement by 2 grades or more from baseline was taken as excellent response. On the right side of the face all patients with grade 2 acne scars 5(100%) showed good response by improving to grade 1. Of the 7 participants with grade 3 scars 6 (85.7%) showed good response by improving to grade 2 and 1(14.3%) patient showed excellent response by

improving to grade 1. Of the 3 participants with grade 4 scar 2(66.7%) showed good response by improving to grade 3 whereas 1(33.3%) showed excellent response by improving to grade 2.

On the left side of the face all participants 6(100%) with grade 2 scars showed good response by improving to grade 1. Of the 6 participants with grade 3 acne scar, 4(66.7%) showed good response by improving to grade 2 whereas 2(33.3%) showed excellent response by improving to grade 1. All 3 participants (100%) with grade 4 acne scar improved to grade 1 with excellent response. [Table 4]

On the right side of the face 13(86.7%) of the study participants showed good response with subcision alone. On the other hand in subcision with PRP group 10(66.7%) of the study participants showed good response. But excellent responses were more in Subcision with PRP group 5(33.3%) compared to subcision only group 2(13.3%). There is a difference in the response between the two groups but it is not found to be statistically significant. [Table 5]

On right side of face –subcision alone only one patient showed some improvement at the first sitting itself, 6 patients after second sitting and 4 patients only after the third sitting. In left side of the face-Subcision with PRP 4(26.67%) showed improvement after first sitting itself, 10(66.6%) after second sitting and only 1(10%) of the patient underwent three sittings to show some improvement. The average number of sitting for subcision with PRP group was 1.8 sitting and subcision alone group was 2.27 sitting and the difference was found to be statistically significant ( $p < 0.05^*$ ). [Table 6]

All the 5 patients who had a very large effect on their quality of life before treatment had a better quality of life at the end of the treatment. Thus the quality of life improved significantly at the end of treatment. [Table 7]

Few additional benefits other than improvement in scar grade were reported on both sides of the face by patients themselves. 4 out of 15 reported decrease in the oily feel of their face, 2 out of 15 reported an improvement in the texture of skin and 1 patient reported the decrease in the onset of new acne lesions post treatment.

Post procedural side effects like mild pain, erythema, edema were seen on both sides of the face in all patients immediately after procedure which settled in one to two days. Hence adding prp did not cause any additional side effects. Prolonged pain, persistent edema, post procedure hyperpigmentation or secondary infection were not reported in our study. [Table 8]

**Images**



**IA) Before and after pictures showing good response on the right side of the face after 4 sittings of subcision alone**



**IB) Before and after pictures showing Excellent response on the left side of the face after 4 sittings of subcision combined with PRP.**



**II A) Before and after pictures showing Good response on the right side of the face after 4 sittings of subcision alone.**



**II B) Before and after pictures showing Excellent response on the left side of the face after 4 sittings of subcision combined with PRP**

**Table 1: Demographic profile of the study participants**

Baseline Characteristics	Number(N) (N=15)	Percentage(%)
Age		
<20 years	2	13.3
21-25years	9	60
26-29 years	3	20
30 years	1	6.7
Sex		
Male	10	66.7
Female	5	33.3
Occupation		
Student	4	26.7
Unemployed	3	20
IT	2	13
Driver	1	6.7
Housewife	1	6.7
Paramedical	1	6.7
Shop owner	1	6.7
Sales representative	1	6.7
Teacher	1	6.7

**Table 2: Epidemiological profile of the study participants**

Variables	Number(N)	Percentages(%)
Past history of inflammatory lesions		
Yes	10	66.7
No	5	33.3
Type of Atrophic acne scar (Right)		
B	1	6.7
B,I	1	6.7
R	2	13.3
R,B	6	40
R,B,I	1	6.7
R,I	4	26.7
Type of Atrophic acne scar (Left)		
B	2	13
B,I	1	6.7
R	5	33.3
R,B	2	40
R,B,I	1	6.7
R,I	4	26.7
Predominant scar type (Right side)		
Box scar	5	33.3
Rolling scar	10	66.7
Predominant scar type (Left side)		
Box scar	5	33.3
Rolling scar	10	66.7

**Table 3: Baseline Goodman and Baron scar grade –both sides of face before treatment**

Variables	Number(N)	Percentages(%)
Subcision alone right side before treatment		
Grade 2	5	33.3
Grade 3	7	46.7
Grade 4	3	20
Subcision with PRP left side before treatment		
Grade 2	6	40
Grade 3	6	40
Grade 4	3	20
Mean baseline scar grade before treatment		
Subcision (Right)	2.80	
Subcision with PRP (Left)	2.80	

**Table 4: Posttreatment improvement with subcision alone on right side and subcision combined with PRP on left side of the face- Scar Grade wise**

Side and grade	Number of subjects	Grade improvement after treatment			
		Subjects with good response		Subjects with excellent response	
Subcision alone right side					
Grade 2	5	5	100%	0	0%
Grade 3	7	6	85.7%	1	14.3%
Grade 4	3	2	66.7%	1	33.3%

Subcision with PRP left side before treatment					
Grade 2	6	6	100%	0	0%
Grade 3	6	4	66.7%	2	33.3%
Grade 4	3	0	0%	3	100%

**Table 5: Comparison of overall response between subcision alone and subcision combined with PRP**

Variables	Good response at the end of the treatment	Excellent response at the end of the treatment	Total	P value
Subcision alone on the right side	13(86.7%)	2(13.3%)	15(100%)	0.195
Subcision with PRP on the left side	10(66.7%)	5(33.3%)	15(100%)	

**Table 6: Number of sittings needed for some improvement in acne scar grade on both sides of face**

Variables	Some improvement in sitting 1	Some improvement only after 2 <sup>nd</sup> sitting	Some improvement only after 3 <sup>rd</sup> sitting
Subcision alone on right side before treatment			
Grade 2	1	3	1
Grade 3	0	4	3
Grade 4	0	3	0
Subcision with PRP on left side before treatment			
Grade 2	2	3	1
Grade 3	1	5	0
Grade 4	1	2	0

**Table 7: DQLI before and after treatment**

DQLI	DQLI before the treatment	DQLI after the treatment	P value
Moderate effect on life (ML)	9	8	0.042*
Small effect on life (SL)	1	7	
Very large effect on life (VL)	5	0	

**Table 8: Additional benefits other than scar improvement**

Additional benefits on both sides of the face	Number of subjects
Reduced seborrhea	4(26.6%)
Decrease in occurrence of new acne lesions	1(6.66%)
Improvement in skin texture	2(13.3%)

## DISCUSSION

In our study majority of the study participants (60%) belonged to 21-25 years of age group. The mean age was 23.8 years. This was similar to the study by Vaishnani et al,<sup>[6]</sup> where all the 100% of the patients were in 21-25 years of age group. In a study by Deshmukh et al,<sup>[7]</sup> the mean age of the study participants was 26.9 years.

66.7% participants of our study were males. This may due to the fact that acne incidence is more in males. Similar results was also seen in Shekar Pradhan et al study where 61.1% were males. But in a study by AL-Dhalimi et al,<sup>[8]</sup> female predominance 83% was seen.

Past history of inflammatory lesions was present in 66.7% of the study participants. Deirdre et al,<sup>[9]</sup> study has also shown the risk of scarring was higher in patient with severe inflammatory lesions. Fernanda Tcatch Lauer mann et al,<sup>[10]</sup> study has also reported that intensity of active lesions has a positive correlation with scarring later.

In our study, 80% of participants had mixed morphological scar types on both the sides. However the predominant scar type was Rolling

scars 10(66.7%) and Box scars 5(33.3%) on both sides of the face. Similarly Layton et al,<sup>[2]</sup> study also showed that mixed scars was the predominant morphology. In our study, the pretreatment scar grade was grade 3 in 46.7%, grade 2 in 33.3% and grade 4 in 20% of the participants. In contrast to our study, Deshmukh et al,<sup>[7]</sup> study showed more study participants 73.68% with grade 4 and 21% with grade 3 scars.

In our study 33.3% of the patients showed excellence response on the left side of the face compared to 13.3% of the patients who showed excellence response on the right side of the face. Similar results was also seen in Deshmukh et al,<sup>[7]</sup> study where 32.08% of study participants showed excellent improvement in Subcision with PRP compared to 8.33% on subcision only.

In our study the average number of sittings needed for some improvement was 1.8 sittings in subcision with PRP group but needed an average of 2.7 sittings in subcision alone group.

DLQI with very large effect was seen in 33.33% of the study participants before treatment which reduced significantly at the end of treatment. In our study additional benefits to scar improvement such

as decrease in oily feel of face and improvement in skin texture were reported by 26.6% and 13.3% participants respectively.

Mild pain, transient erythema and transient edema were seen in all the patients on both sides of the face after the procedure. Post procedure hyperpigmentation was not reported in our study whereas in Deshmukh et al,<sup>[7]</sup> study hyperpigmentation was seen as a late side effect. No additional side effects were observed with addition of prp injection.

#### **Limitations**

Our study sample size was small. Larger sample size could have given more significant results. Subjects were followed up only for a period of six months after treatment completion. Longer follow-ups could have given long term results of the treatment.

### **CONCLUSION**

Clearance of acne scars is the primary concern of acne patients. Though many modalities arrives surgical scar revision remains the promising modality. Our study concludes subcision combined with PRP (Platelet rich plasma) showed better results and earlier response than subcision alone. It is also cost effective. No additional side effects observed while combining PRP. Thus PRP can be used as an adjunct to subcision for managing acne scars.

#### **Funding**

None of the authors received funding for this study

#### **Competing Interest**

There is no competing interest

#### **Authors Contribution**

All authors in our study contributed to the data collection of the patients

#### **Acknowledgement**

The authors like to thank the Dean of the Medical College, Head of the Department of Dermatology, Rajiv Gandhi Medical College and Hospital ,Madurai ,Tamil Nadu.

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