

## Subcision with Blunt Cannula in Combination with Injection of PRP and Microneedling in Treatment of Acne Scar

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### ABSTRACT

**Background:** A significant section of the population is affected by the common and long-lasting consequence of acne vulgaris called acne scarring. It is essential to create a plan for each instance individually since treating acne scars can be difficult. **Objectives:** This study aimed to evaluate the result of using subcision with blunt cannula in combination with injection of platelet-rich plasma and micro needling in treatment of post acne rolling scars.

**Patients and methods:** During September 2019 up to January 2021, a pilot clinical trial was conducted on 50 patients suffered from mild to severe rolling acne scars on their face at Menoufia University Hospitals.

**Results:** Ordinary acne and number of sessions for scar types were significantly increased with sub-cession, derma pen and plasma group (69%) than in sub-cession (0%) and in sub-cession and plasma (4%) groups ( $p < 0.05$ ). While there was a significant difference between the studied groups regarding types of scars where rolling scar was the most frequent among sub-cession and sub-cession and plasma groups than in sub-cession, derma pen and plasma group ( $p < 0.05$ ). On the other hand, there was no significant difference between the studied groups regarding age of onset of acne, ( $p > 0.05$ ), previous types of scars, ( $p > 0.05$ ) and patient and physician satisfaction, ( $p > 0.05$ ).

**Conclusion:** According to the findings of our study, platelet-rich plasma (PRP) and radiofrequency (RF) microneedling were effective treatments for atrophic acne scars in more than 80% of patients, with few adverse effects.

**Keywords:** Acne Scar, Platelet-rich plasma, Radiofrequency microneedling.

### INTRODUCTION

Acne is a common dermatological condition that can leave scars that vary greatly in appearance and depth, making it a major cause of aesthetic deformity. Depending on the kind and degree of tissue damage that remains after the initial lesion has healed, there are many therapies available [1]. One of the suggested therapies, subcision, has been shown to rupture the fibrous band, notably in post-acne deep rolling scars [2].

Depressed acne scars can be treated with the quick and secure office surgery procedure known as subcision. By breaking the fibrous strands that bind the scar to the underlying tissue using a needle or cannula, subcision is also known as subcutaneous incisionless surgery. It was carried out under topical or infiltration of local anaesthesia [3]. The process of spinning down a patient's own blood produces platelet-rich plasma. Its capacity to deliver large concentrations of growth factors to the target tissue underpins is good [4]. Autologous platelet-rich plasma is a cutting-edge alternative for managing acne scars and can be used in conjunction with other acne scar treatments. It reduces the total number of sittings when used adjuvantly [5].

One of the many options for reducing acne scars is microneedling. The epidermis' outer layer is carefully removed using a tiny portable instrument. This procedure will make the toned, supple skin underlying visible. Dermatologists puncture the skin with a specific roller or needle-equipped instrument to encourage the synthesis of new collagen. As a result, microneedling is often referred

to as percutaneous collagen induction or collagen induction treatment [6].

The majority of acne sufferers have damage to their skin underneath the surface, which manifests as saucer-shaped depressions or skin pits. Rolling scars are described as having a waxy texture because they strain on the epidermis as the skin loses its underlying support and develops fibrous bands of tissue between the skin and subcutaneous layer [2].

The therapeutic issue of treating acne scars may call for the use of several techniques. Rolling acne scars have been successfully treated using a surgery known as subcision with a blunt cannula [2].

The aim of this study was to evaluate the result of using subcision with blunt cannula in combination with injection of platelet rich plasma and micro needling in treatment of post acne rolling scars.

### PATIENTS AND METHODS

A pilot clinical trial was conducted on 50 patients suffered from mild to severe rolling acne scars on their face at Menoufia University Hospital during the period from September 2019 up to January 2021.

**Inclusion criteria:** The age range from 18 to 40 years and a case with atrophic acne scars (Grade 2–4) according to Goodman and Baron's classification system.

**Exclusion Criteria:** Active acne lesions, any infectious diseases, such as herpes simplex, HI, bacterial infections, warts, HVC-AB, HVB-Ag, actinic keratosis, skin cancers, history of keloid, bleeding disorder,

lignocaine hypersensitivity, immunocompromised status, and unrealistically high expectations, as well as systemic retinoid use in the preceding six months and severe systemic illness (Hb<10g/dl or platelet <105mic/L).

For all subjects the following procedures were performed: All patients included in this study underwent careful history taking using a specially designed sheet that included demographic information such as name, age, sex, address, residence, occupation, marital status, and special habits, as well as information on any medical conditions that were present or that had previously occurred, including their nature, length of time they had been treated, any medications they had been taking, as well as their dosage schedule and duration of use, age at which they first manifested, previous types of acne and the number of sessions they had received.

**Ethical approval:**

Signed informed consents were obtained from all participants before starting the research. The Menoufia University Hospital's Ethical Scientific Committee granted approval for the study plan. The study was conducted out in line with the Helsinki Declaration.

**Statistical analysis**

A report form was used to capture the clinical data. The SPSS (Statistical package for social science) version 21 computer application was used to tabulate and analyse this data. Using the Kolmogorov-Smirnov test, the normality of all variables was examined, if the test's results were significant, non-normality was acknowledged. Otherwise, it was necessary to establish normalcy using graphs, skewness, and kurtosis. Mean and standard deviation for quantitative data and percentages and numbers for categorical variables were expressed as descriptive statistics for the data. For statistical analysis, one of the following tests was used to determine the significance of difference in the statistical comparison between the several groups: t-test for students Using the chi square test (X<sup>2</sup>-value), Chi-Squared (X<sup>2</sup>), Kruskal-Wallis test (nonparametric test), and correlation coefficient test, categorical data were compared between groups. P value ≤ 0.05 was regarded as significant.

**RESULTS**

A total of 50 patients their ages ranged from 22.00 to 44.00 years with mean of 30.42 ± 5.36 years. While, most of the studied patients (88.0%) were females, the range of age of onset of acne of the studied patients ranged from 13.00 to 20.00 years with mean of 15.46 ± 2.02 years. While, 48.0% of the studied patients had ordinary acne, previously and the range of physician satisfaction was 0.00-90.00 with mean 63.20 ± 24.11.

While 92.0% of the studied patients were satisfied. The range of number of sessions for scar types of the studied patients was 1.00-6.00 with mean of 2.14 ± 1.32. While, 36.0%, 48.0% and 58.0% of the studied patients had rolling ice picks scar, fractional scars previously and did sub-cession, derma pen and plasma session, respectively (Table 1).

**Table (1):** Descriptive data of the studied patients (N=50).

| Variables                                 | Studied cases (N=50) |              |
|---|----------------------|--------------|
|   | Mean ± SD            | Range        |
| <b>Age (years)</b>                        | 30.42 ± 5.36         | 22.00-44.00  |
| <b>Sex, (no, %)</b>                       |                      |              |
| Male                                      | 6                    | 12.0         |
| Female                                    | 44                   | 88.0         |
| <b>Age of onset of acne (years)</b>       | 15.46 ± 2.02         | 13.00-20.00  |
| <b>Previous types of acne, (no, %)</b>    |                      |              |
| No  | 19                   | 38.0         |
| Net look                                  | 6                    | 12.0         |
| Roaccutane                                | 1                    | 2.0          |
| Ordinary                                  | 24                   | 48.0         |
| <b>Physician satisfaction</b>             | 63.20 ± 24.11        | 0.00-90.00   |
| <b>Patient satisfaction, (no, %)</b>      |                      |              |
| Very satisfied                            | 4                    | 8.0          |
| Satisfied                                 | 46                   | 92.0         |
| <b>Types of scars, (no, %)</b>            |                      |              |
| Rolling box scar                          |                      |              |
| Rolling scar                              | 6                    | 12.0         |
| Rolling ice picks scar                    | 15                   | 30.0         |
| Rolling ice picks box scar                | 18                   | 36.0         |
| Box scar                                  | 7                    | 14.0         |
|   | 4                    | 8.0          |
| <b>Previous types of scars, (no, %)</b>   |                      |              |
| No  |                      |              |
| Fractional                                | 18                   | 36.0         |
| Derma pen                                 | 24                   | 48.0         |
| Fractional and derma pen                  | 2                    | 4.0          |
|   | 6                    | 12.0         |
| <b>Session of types of scars, (no, %)</b> |                      |              |
| Sub cession                               |                      |              |
| Sub cession and plasma                    | 2                    | 4.0          |
| Sub cession, derma pen and plasma         | 19                   | 38.0         |
|   | 29                   | 58.0         |
|   | <b>Mean ± SD</b>     | <b>Range</b> |
| <b>Number of sessions for scar types</b>  | 2.14 ± 1.32          | 1.00-6.00    |

Regarding, ordinary acne and number of sessions for scar types, there were significant increase in sub-cession derma pen and plasma group (69%) than in sub-cession (0%) and in sub-cession and plasma (4%) groups, ( $p < 0.05$ ). While there was significant difference between the studied groups regarding types of scars where rolling

scars were the most frequent among sub-cession and sub-cession and plasma groups than in sub-cession derma pen and plasma group ( $p < 0.05$ ). On the other hand, there was non-significant difference between the studied groups regarding age of onset of acne, ( $p > 0.05$ ), previous types of scars, ( $p > 0.05$ ) and patients' and physicians' satisfaction, ( $p > 0.05$ ) (Table 2).

**Table (2):** Treatment types in relation to studied variables of the studied groups.

| Variables                                 | Sessions groups                |     |                                   |      |   |    | F              | P value           |
|---|--------------------------------|-----|-----------------------------------|------|---|----|----------------|-------------------|
|   | Sub cession<br>N=2             |     | Sub-cession and<br>plasma<br>N=19 |      | Sub-cession,<br>derma pen and<br>plasma<br>N=29 |    |                |                   |
| <b>Age of onset of acne</b>               |                                |     |                                   |      |   |    |                |                   |
| Mean ± SD                                 | 16.00±0.00                     |     | 15.53±2.34                        |      | 15.38±1.90                                      |    | 0.101          | 0.904             |
| Range                                     | 16.00-16.0                     |     | 13.00-20.00                       |      | 13.00-19.00                                     |    |                |                   |
|   | No.                            | %   | No.                               | %    | No.   | %  | X <sup>2</sup> | P value           |
| <b>Previous types of acne</b>             |                                |     |                                   |      |   |    |                |                   |
| No  | 2                              | 100 | 11                                | 57.9 | 6   | 21 | 15.67          | <b>0.016*</b>     |
| Net look                                  | 0                              | 0.0 | 4                                 | 21.1 | 2   | 7  |                |                   |
| Roaccutane                                | 0                              | 0.0 | 0                                 | 0.0  | 1   | 3  |                |                   |
| Ordinary                                  | 0                              | 0.0 | 4                                 | 21.1 | 20  | 69 |                |                   |
| <b>Types of scars</b>                     |                                |     |                                   |      |   |    |                |                   |
| Rolling box scar                          | 0                              | 0.0 | 2                                 | 10.5 | 4   | 14 | 19.316         | <b>0.013*</b>     |
| Rolling scar                              | 2                              | 100 | 10                                | 52.6 | 3   | 10 |                |                   |
| Rolling ice picks scar                    | 0                              | 0.0 | 7                                 | 36.8 | 11  | 38 |                |                   |
| Rolling ice picks box scar                | 0                              | 0.0 | 0                                 | 0.0  | 7   | 24 |                |                   |
| Box scar                                  | 0                              | 0.0 | 0                                 | 0.0  | 4   | 14 |                |                   |
| <b>Previous types of scars</b>            |                                |     |                                   |      |   |    |                |                   |
| No  | 0                              | 0.0 | 9                                 | 47.4 | 9   | 31 | 8.870          | 0.181             |
| Fractional                                | 2                              | 100 | 10                                | 52.6 | 12  | 41 |                |                   |
| Derma pen                                 | 0                              | 0.0 | 0                                 | 0.0  | 2   | 7  |                |                   |
| Fractional and derma pen                  | 0                              | 0.0 | 0                                 | 0.0  | 6   | 21 |                |                   |
| <b>Number of sessions for scars types</b> |                                |     |                                   |      |   |    |                |                   |
| Mean ± SD                                 | 1.00±0.00                      |     | 1.11±0.32                         |      | 2.90±1.26                                       |    | F= 19.992      | <b>&lt;0.001*</b> |
| Range                                     | 1.00-1.00                      |     | 1.00-2.00                         |      | 1.00-6.00                                       |    |                |                   |
| <b>Post Hoc</b>                           | P1=0.887, P2=0.012*, P3<0.001* |     |                                   |      |   |    |                |                   |
| <b>Patient satisfaction</b>               |                                |     |                                   |      |   |    |                |                   |
| Very satisfied                            | 0                              | 0.0 | 2                                 | 10.5 | 2   | 7  | 0.387          | 0.824             |
| Satisfied                                 | 2                              | 100 | 17                                | 89.5 | 27  | 93 |                |                   |
| <b>Physician satisfaction</b>             |                                |     |                                   |      |   |    |                |                   |
| Mean ± SD                                 | 80.00±0.00                     |     | 63.68±14.61                       |      | 61.72±29.29                                     |    | K= 0.533       | 0.590             |
| Range                                     | 80.0-80.00                     |     | 40.00-90.00                       |      | 0.00-90.00                                      |    |                |                   |

Regarding, age and physicians' satisfaction, they were significantly increased among rolling scar group than among rolling box scar, rolling ice picks scar, rolling ice picks box scar and box scar groups ( $p < 0.05$ ).

While, age of onset of acne and number of sessions for scar types were significantly increased among rolling box scar group than among rolling scar, rolling ice picks scar, rolling ice picks box scar and box scar groups, ( $p < 0.05$ ). While, there were significant differences between types of scar groups regarding previous types of scars and session of types of scars ( $p < 0.05$ ) where

fractional scars were the most frequent among rolling box scar, rolling scar and box scar groups than among rolling ice picks scar and rolling ice picks box scar groups. While, sub-cession, derma pen and plasma were most frequent among rolling ice picks scar, rolling ice picks box scar and box scar groups than among rolling box scar and rolling scar groups.

On the other hand, there was no significant difference between types of scar groups regarding sex, patient satisfaction and previous types of acne, ( $p > 0.05$ ) (Table 3).

**Table (3):** Types of scars in relation to studied variables of the studied groups.

| Variables  | Types of scars  |                            |                                |                             |                                 |                             |                                  |                              |                                |                          | K                     | P value           |
|--|---|----------------------------|--------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------------|------------------------------|--------------------------------|--------------------------|-----------------------|-------------------|
|  | Rolling box scar<br>N=6   |                            | Rolling scar<br>N=15           |                             | Rolling ice picks scar<br>N=18  |                             | Rolling ice picks box scar (N=7) |                              | Box scar<br>N=4                |                          |                       |                   |
|  | No.   | %                          | No.                            | %                           | No.                             | %                           | No.                              | %                            | No.                            | %                        |                       |                   |
| <b>Age/years</b><br>Mean $\pm$ SD<br>Range   | 26.00 $\pm$ 3.10<br>24.00-30.00   |                            | 35.20 $\pm$ 5.57<br>27.00-44.0 |                             | 29.39 $\pm$ 4.49<br>22.00-39.00 |                             | 28.00 $\pm$ 2.52<br>26.00-33.00  |                              | 28.00 $\pm$ 0.00<br>28.00-28.0 |                          | 7.088                 | <b>&lt;0.001*</b> |
| <b>Post Hoc</b>  | P1<0.001*, P2=0.108, P3=0.416, P4=0.483, P5<0.001*, P6=0.001*, P7=0.005*, P8=0.480, P9=0.569, P10=NA  |                            |                                |                             |                                 |                             |                                  |                              |                                |                          |                       |                   |
| <b>Sex</b><br>Male<br>Female   | 0<br>6  | 0.0<br>100                 | 0<br>15                        | 0.0<br>100                  | 4<br>14                         | 22.2<br>77.8                | 2<br>5                           | 28.6<br>71.4                 | 0<br>4                         | 0.0<br>100               | X <sup>2</sup> =7.01  | 0.135             |
| <b>Age of Onset of Acne</b><br>Mean $\pm$ SD<br>Range  | 17.33 $\pm$ 1.86<br>15.00-19.00   |                            | 15.80 $\pm$ 1.21<br>14.0-17.00 |                             | 14.44 $\pm$ 2.25<br>13.00-20.00 |                             | 16.00 $\pm$ 2.31<br>14.00-19.00  |                              | 15.00 $\pm$ 0.00<br>15.00-15.0 |                          | 3.187                 | <b>0.022*</b>     |
| <b>Post Hoc</b>  | P1=0.095, P2=0.002*, P3=0.205, P4=0.059, P5=0.043*, P6=0.816, P7=0.449, P8=0.067, P9=0.592, P10=0.396 |                            |                                |                             |                                 |                             |                                  |                              |                                |                          |                       |                   |
| <b>Previous types of acne</b><br>No<br>Net look<br>Roaccutane<br>Ordinary                                      | 2<br>0<br>0<br>4  | 33.3<br>0.0<br>0.0<br>66.7 | 6<br>4<br>0<br>5               | 40.0<br>26.7<br>0.0<br>33.3 | 7<br>2<br>1<br>8                | 38.9<br>11.1<br>5.6<br>44.4 | 4<br>0<br>0<br>3                 | 57.1<br>0.0<br>0.0<br>42.9   | 0<br>0<br>0<br>4               | 0.0<br>0.0<br>0.0<br>100 | X <sup>2</sup> =12.22 | 0.429             |
| <b>Previous types of scars</b><br>No<br>Fractional<br>Derma pen<br>Fractional and derma pen                    | 4<br>2<br>0<br>0  | 66.7<br>33.3<br>0.0<br>0.0 | 4<br>11<br>0<br>0              | 26.7<br>73.3<br>0.0<br>0.0  | 8<br>6<br>0<br>4                | 44.4<br>33.3<br>0.0<br>22.2 | 2<br>1<br>2<br>2                 | 28.6<br>14.3<br>28.6<br>28.6 | 0<br>4<br>0<br>0               | 0.0<br>100<br>0.0<br>0.0 | X <sup>2</sup> =29.28 | <b>0.004*</b>     |
| <b>Session of types of scars</b><br>Sub cession<br>Sub cession and plasma<br>Sub cession, derma pen and plasma | 0<br>2<br>4   | 0.0<br>33.3<br>66.7        | 2<br>10<br>3                   | 13.3<br>66.7<br>20.0        | 0<br>7<br>11                    | 0.0<br>38.9<br>61.1         | 0<br>0<br>7                      | 0.0<br>0.0<br>100            | 0<br>0<br>4                    | 0.0<br>0.0<br>100        | X <sup>2</sup> =19.32 | <b>0.013*</b>     |
| <b>Number of sessions for scars types</b><br>Mean $\pm$ SD<br>Range  | 15.46 $\pm$ 2.02<br>13.00-20.00   |                            | 2.00 $\pm$ 0.00<br>2.00-2.00   |                             | 1.40 $\pm$ 0.83<br>1.00-3.00    |                             | 2.22 $\pm$ 1.26<br>1.00-4.00     |                              | 3.71 $\pm$ 1.98<br>1.00-6.00   |                          | F=4.841               | <b>0.002*</b>     |
| <b>Post Hoc</b>  | P1=0.288, P2=0.685, P3=0.011*, P4=NA, P5=0.048, P6<0.001*, P7=0.361, P8=0.006*, P9=0.730, P10=0.022*  |                            |                                |                             |                                 |                             |                                  |                              |                                |                          |                       |                   |
| <b>Physician satisfaction</b><br>Mean $\pm$ SD<br>Range  | 66.67 $\pm$ 20.66<br>40.00-80.00  |                            | 78.00 $\pm$ 9.41<br>70.00-90.0 |                             | 50.00 $\pm$ 30.68<br>0.00-90.00 |                             | 70.00 $\pm$ 16.33<br>50.00-90.00 |                              | 50.00 $\pm$ 0.00<br>50.00-50.0 |                          | F=4.031               | <b>0.007*</b>     |
| <b>Post Hoc</b>  | P1=0.283, P2=0.108, P3=0.783, P4=0.238, P5=0.001, P6=0.422, P7=0.026, P8=.043, P9=NA, P10=0.146       |                            |                                |                             |                                 |                             |                                  |                              |                                |                          |                       |                   |
| <b>Patient satisfaction</b><br>Very satisfied<br>Satisfied   | 2<br>4  | 33.3<br>66.7               | 2<br>13                        | 13.3<br>86.7                | 0<br>18                         | 0.0<br>100                  | 0<br>7                           | 0.0<br>100                   | 0<br>4                         | 0.0<br>100               | X <sup>2</sup> =8.33  | 0.080             |

There were significant relations between physician satisfaction with types of scars and patient satisfaction, ( $p < 0.05$ ). On the other hand, there were no significant relations between physician satisfaction with any previous types of acne, scars and session of types of scars, ( $p > 0.05$ ) (Table 4).

**Table (4):** Relation between physician satisfaction and the studied parameters.

| Variables                          | Physician satisfaction |            |        | K           | P value           |
|------------------------------------|------------------------|------------|--------|-------------|-------------------|
|                                    | Mean $\pm$ SD          | Range      | Median |             |                   |
| <b>Types of scars</b>              |                        |            |        |             |                   |
| Rolling box scar                   | 66.67 $\pm$ 20.66      | 40.0-80.0  | 80.00  | 4.031       | <b>0.007*</b>     |
| Rolling scar                       | 78.00 $\pm$ 9.41       | 70.00-90.0 | 70.00  |             |                   |
| Rolling ice picks scar             | 50.00 $\pm$ 30.68      | 0.00-90.00 | 55.00  |             |                   |
| Rolling ice picks box scar         | 70.00 $\pm$ 16.33      | 50.00-90.0 | 60.00  |             |                   |
| <b>Any previous types of acne</b>  |                        |            |        |             |                   |
| No                                 | 64.21 $\pm$ 11.70      | 50.0-80.00 | 70.00  | 1.472       | 0.234             |
| Net look                           | 76.67 $\pm$ 10.33      | 70.0-90.00 | 70.00  |             |                   |
| Ordinary                           | 57.92 $\pm$ 31.62      | 0.00-90.00 | 60.00  |             |                   |
| <b>Any previous types of scars</b> |                        |            |        |             |                   |
| No                                 | 68.89 $\pm$ 14.91      | 50.00-90.0 | 70.00  | 1.012       | 0.396             |
| Fractional                         | 57.08 $\pm$ 30.43      | 0.00-90.00 | 70.00  |             |                   |
| Derma pen                          | 65.00 $\pm$ 21.21      | 50.00-80.0 | 65.00  |             |                   |
| Fractional and derma pen           | 70.00 $\pm$ 15.49      | 60.00-90.0 | 60.00  |             |                   |
| <b>Session of types of scars</b>   |                        |            |        |             |                   |
| Sub cession and plasma             | 63.68 $\pm$ 14.61      | 40.00-90.0 | 70.00  | U=<br>0.533 | 0.590             |
| Sub cession, derma pen and plasma  | 61.72 $\pm$ 29.29      | 0.00-90.00 | 60.00  |             |                   |
| <b>Patient satisfaction</b>        |                        |            |        |             |                   |
| Very satisfied                     | 85.00 $\pm$ 5.77       | 80.00-90.0 | 85.00  | U=<br>5.165 | <b>&lt;0.001*</b> |
| Satisfied                          | 61.30 $\pm$ 24.19      | 0.00-90.00 | 65.00  |             |                   |

There was significant positive correlation between physician satisfactions with age of onset of acne. While there was significant negative correlation between physician satisfaction with types of scars ( $p < 0.05$ ). Also, there was significant positive correlation between patient satisfaction with age and types of scars.

While there was significant negative correlation between patient satisfaction with any previous types of acne and physician satisfaction ( $p < 0.05$ ). On the other hand, there were no significant correlations between physician and patient satisfaction with other parameters ( $p > 0.05$ ) (Table 5).

**Table (5):** Correlation between physician and patient satisfaction with the studied parameters.

| Variables                          | Physician satisfaction |                   | Patient satisfaction |               |
|------------------------------------|------------------------|-------------------|----------------------|---------------|
|                                    | r                      | p-value           | r                    | p-value       |
| Age (years)                        | -0.049                 | 0.737             | 0.350                | <b>0.013*</b> |
| Sex                                | 0.143                  | 0.322             | -0.109               | 0.452         |
| Age of onset of acne (years)       | 0.552                  | <b>&lt;0.001*</b> | -0.135               | 0.351         |
| Types of scars                     | -0.338                 | <b>0.016*</b>     | 0.357                | <b>0.011*</b> |
| Any previous types of acne         | -0.004                 | 0.975             | -0.291               | <b>0.040*</b> |
| Any previous types of scars        | -0.054                 | 0.712             | 0.123                | 0.397         |
| Number of sessions for scars types | -0.088                 | 0.542             | 0.129                | 0.372         |
| Session of types of scars          | 0.019                  | 0.897             | 0.035                | 0.807         |
| Physician satisfaction             | NA                     | -----             | -0.327               | <b>0.021*</b> |
| Patient satisfaction               | -0.327                 | 0.021             | NA                   | ---           |

## DISCUSSION

In the current study, a total of 50 patients their ages ranged from 22–44 years with a mean of  $30.42 \pm 5.36$  years. While, most of the studied patients (88.0%) were females. Our result is closed to the result of **Porwal *et al.***<sup>[7]</sup> who observed that, females outnumbered males. In their investigation, **Goulden *et al.***<sup>[8]</sup> found that scarring was more prevalent in men. Males in our nation may be less self-conscious and less likely to seek assistance. In our study sample, the average patient age was 26.37 years, with the majority of patients (65.38%) falling in the 25–30 age range. According to **Majid**<sup>[9]</sup>, the patients' observed ages varied from 13 to 34 years, with a mean age of 22.4 years.

In our result, the range of physician satisfaction was 0.00–90.00 with a mean of  $63.20 \pm 24.11$ . While, 92.0% of the studied patients were satisfied. Also, new study by **Barikbin *et al.***<sup>[10]</sup> used blunt blade subcision for the treatment of acne scars. According to this study, 66.7% of patients reported very high treatment satisfaction, whereas 5.5% and 27.8% of patients had low and moderate satisfaction, respectively. Although we had lower satisfaction rates than **Barikbin *et al.***<sup>[10]</sup>, their work with blunt cannulas showed less problems, which were restricted to edoema.

**Nilforoushadeh *et al.***<sup>[2]</sup> revealed that in a prior study, they evaluated all facets of the usage of a different special device (Cannula) in sub-session of acne-induced scars, which they found to be both safe and effective. We concentrated on treating rolling scars caused by fibrous bands caused by acne scars using the sub-session method with a cannula. In contrast to previous reported statistics (between 30 and 40%), we found an impressive cure rate (more than 50% after two weeks). Another advantage of our newly developed technique is that sub-session with cannula was conducted using a single hole on each side rather than several perforations, which helps to lessen the discomfort of the patients and the danger of scarring both during and after the treatment. Additionally, compared to needle-based sub-session, cannula-based sub-session required much fewer surgical procedures and shorter hospital stays. In general, all of these positive aspects contribute to greater patient satisfaction.

The present study observed that, number of sessions for scar types was significantly increased among sub-session, derma pen and plasma group than among sub-session and plasma and sub-session groups. While, there was significant difference between the studied groups regarding types of scars where rolling scars were the most frequent among sub-session and sub-session and plasma groups than among sub-session, derma pen and plasma groups ( $p < 0.05$ ). On the other hand, there was no significant difference between the studied groups regarding previous types of scars, ( $p > 0.05$ ). In this regard, **Porwal *et al.***<sup>[7]</sup> found that the majority of their patients

(47.27%) had ice pick, boxcar, and rolling scars, which were followed by ice pick and boxcar scars. According to **Jacob *et al.***<sup>[11]</sup>, the ice pick type accounts for 60%–70% of all scars, followed by box scars (20–30%) and rolling scars (15–25%). Also, **Al-aajem *et al.***<sup>[12]</sup> discovered a correlation between the number of sessions and the cases' prognosis where patients who received more than five sessions had great outcomes in comparison with those who did less sessions. To the best of our knowledge, no independent study has examined the quantity of PRP and RF sessions and their potential connection to the development of the treatment for acne scarring. Furthermore, the advantages of injecting plasma gel alone vs topical treatment in conjunction with derma roller in patients with atrophic post-acne scars have also been researched by **Elfar and Hasby**<sup>[13]</sup>.

Nonetheless, the plasma gel injection demonstrated a noticeable change for the majority of patients after one session in this trial, even though the combined treatment produced higher improvement. The main issue with this study is that it did not use a split-face analysis as in our present study.

**Sun *et al.***<sup>[14]</sup> investigated the therapeutic effectiveness of injecting plasma protein gel and concentrated growth factor for various face scars. In comparison with basic plasma protein gel, the scar severity was significantly reduced by their unique combination. We think there is a strong desire to strengthen plasma gel with additional growth factors or even drugs to increase effectiveness. However, the potential dangers of such combinations should, always be taken into account. Nucleogenesis is stimulated by needling and continues for a few months after the treatment<sup>[15]</sup>. Consequently, there is proof that needling acne scars offers more than a fleeting benefit<sup>[16]</sup>. As there is no epidermal injury, the quantity of melanocytes is unaffected, making needling safe for those with darker skin<sup>[17]</sup>. If the patient complies with post-procedure guidelines such sun protection and avoiding photosensitizing medications, these factors may explain why post-inflammatory hyperpigmentation is not observed following needling.

In our study, regarding patient and physician satisfaction, there were no differences between the analysed groups ( $p > 0.05$ ). Half of the patients in a prior research by **Al-Hammamy *et al.***<sup>[18]</sup> were fairly happy with the operation. During the six-month checkup, 19% of participants thought their scars had little impact on their life and 50% said they were only somewhat irritating. Erythema, bruising, and edoema were the most frequent adverse reactions. Around 12 weeks after therapy, they all vanished. **Alam *et al.***<sup>[19]</sup> investigated the effectiveness of sub-session for the treatment of rolling acne scars in 40 patients by comparing our findings to those of other research. They showed that treating depressed scars using

sub-session was a successful procedure. Nonetheless, assessment was based on patient satisfaction and investigator ratings. It is important to note that **Balighi et al.** [20] treated 22 patients' depressed acne scars with sub-session. They came to the conclusion that subcision appeared to be a secure procedure with long-term benefit to treat the rolling acne scars. Moreover, **Chawla et al.** [21] found that using PRP in conjunction with microneedling resulted in an 18.5% improvement in acne scars (Goodman and Baron qualitative grade), compared to a 7% improvement when using vitamin C and microneedling. According to a split-face comparison research by **Deshmukh et al.** [22], which evaluated the severity of acne scars on 12 individuals using a 10-point scale. PRP combined with skin microneedling improved acne scars by 45% as opposed to skin microneedling alone (35%) improvement. These results are consistent with the study's findings (45.28% improvement in the patients' subjective score), according to the authors. PRP can therefore be used well in conjunction with sub-session if microneedling is not possible or available, and it appears to increase the results of both procedures equally.

In a similar vein, **Chawla et al.** [21] came to the conclusion that PRP improved the effectiveness of microneedling in rolling and box-shaped scars. The authors of the same study discovered that PRP and microneedling were ineffective for healing icepick scars. A research by **Bhargava et al.** [23] showed that PRP and sub-session + needling therapy can work together synergistically. This may be because the needling process makes it easier for PRP to absorb. PRP's growth factors promote healing following sub-session and needling, resulting in improved scar quality and a shorter period of edoema and erythema. In a separate study by **Nandini et al.** [24], researchers explored several treatment protocol combinations to meet patient needs based on skin type and scar kind.

In a research by **Fabbrocini et al.** [15], it was discovered that using skin needling and PRP together improved scar lesions more than using skin needling alone. In their research, they also discovered that a combination approach was the most successful. Platelet-rich plasma (PRP) has recently been used alone or in conjunction with microneedling as a successful therapy for atrophic acne scars. Such a treatment has been tried and studied by a number of dermatologists and plastic surgeons, however the outcomes differed from centre to centre.

**Hesseler and Shyam** [25] came to the conclusion that adding platelet-rich plasma to the therapy regimen considerably shortened postoperative surgery downtime, corrected acne scars, and boosted patient satisfaction. **Ibrahim et al.** [26] came to the conclusion that either micro-needling alone or in combination with PRP was effective for treating acne scars. Nevertheless, **Porwal et**

**al.** [7], **Chawla** [21] and **El-Domyati et al.** [27] discovered that using a combination of a "dermaroller and PRP" to treat acne scars was more effective than using a "dermaroller alone. **Gulanikar and Vidholkar** [28] and **Betsi** [29] conducted earlier research that suggested the PRP technique is safe. Nevertheless, there are certain negative effects to this operation, including bruising, swelling, infection, moderate scarring, changes in colour, and sluggish recovery. Some discomfort was noted in a research by **Al-aajem et al.** [12] with topical anaesthetic. Three patients had folliculitis at the site of puncturing by the PRP or RF needles, despite all measures being taken to prepare patients, including the use of a topical antiseptic before puncturing, topical antibiotics used after the operation, and the application of sunscreen.

## CONCLUSIONS

All of the patients participating in the research had lower scar severity grades after therapy according to the study. Platelet-rich plasma and radiofrequency microneedling were found to be a useful option in the treatment of atrophic acne scars and giving excellent and good results in more than 80% of patients with minimal side effects. However, the combination of microneedling and PRP was found to be more effective than a single method used for the treatment of acne scars.

Furthermore, the combination of PRP and sub-session works synergistically to enhance the overall appearance of atrophic post acne scars, and the number of sessions is strongly correlated with the development of satisfying outcomes. Sub-session coupled with autologous plasma gel injection is a safe, effective method for treating atrophic post-acne scars.

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