

## A Minimally Invasive Treatment Method for Facial Wrinkle Reduction in Skin of Color

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### Abstract

**Background:** Microneedling is a minimally invasive procedure wherein very fine needles are used to induce micro punctures on the skin. Platelet Rich Plasma is a highly promising wound healing agent and hyaluronic acid is an excellent remedy for skin sag. The aim of this study is to analyse the effectiveness of adding PRP and hyaluronic acid to micro-needling therapy, especially in terms of wrinkle and fine line reduction in the face and neck of patients with skin of colour.

**Methods:** The patients were all of Indian origin. Fifty healthy female patients whose ages were between twenty-five to fifty and who were in different stages of wrinkle and fine line development. Six sessions of micro-needling along with topical application of freshly made PRP mixed with 0.5cc 3.5% hyaluronic acid were done for each patient at an interval of three weeks. Photographs were taken before the beginning of the next session and analysis was done based on the Modified Fitzpatrick Wrinkle Scale. The wrinkle scale reading corresponding to forehead wrinkles, crow's feet, nasolabial folds and marionette lines were taken into consideration. Micro-needling was done after the application of a topical anaesthetic agent and PRP derived from centrifuging the blood of the patient along with freshly made hyaluronic acid was deposited during micro-needling. The patients were advised to use a gentle cleanser for the face and neck and apply a medical-grade sunscreen with SPF 40 every day without fail.

**Results:** On analysing the photographs of the fifty patients everyone showed visible improvement in her wrinkle scale right from the second session onwards. Healing was satisfactory no complications developed through the course of the treatment.

**Conclusion:** Micro-needling combined with PRP and hyaluronic acid proves to be a promising anti ageing regimen providing holistic results by doing damage reversal, maintenance and prevention of accelerated collagen breakdown.

**Key Message:** Microneedling with topical application of PRP and hyaluronic acid shows considerable wrinkle reduction in Indian skin.

**Keywords:** *Minimally Invasive Treatment; Facial Wrinkle Reduction; Skin of Color; Microneedling; Platelet Rich Plasma; PRP; Hyaluronic Acid*

### Introduction

Microneedling is a minimally invasive procedure done under topical anaesthesia wherein very fine needles are used to induce micro punctures on the skin. Platelet rich plasma is a highly promising wound healing agent. Hyaluronic acid is an excellent remedy for skin sag.

The aim of this study is to analyse the effectiveness of adding PRP and hyaluronic acid to micro-needling therapy, especially in terms of wrinkle and fine line reduction in the face and neck of patients with skin of colour.

### Subjects and Methods

The patients were all of Indian origin and fell under Fitzpatrick skin type IV to VI. Informed consent was obtained from all of them along with photo and video publication rights. Fifty healthy female patients whose ages were between twenty-five to fifty and who were in different stages of wrinkle and fine line development on the face and neck ranging between Modified Fitzpatrick Wrinkle Scale 0 to 3 were selected for the study. The patients were not allowed to undergo any botox, fillers, surgical dermabrasion, deep facial peels, or laser therapy during the course of the treatment. Six sessions of micro-needling along with a topical application of freshly centrifuged PRP mixed with freshly prepared 0.5cc 3.5% hyaluronic acid solution were done for each patient at an interval of three weeks. The micro-needling device used was used with a new sterile cartridge having 12 needles for every session and the maximum depth of penetration was not more than 2.0 mm. Photographs were taken by the same professional photographer in the same room, blue background with two lights at a forty-five-degree angle and a professional grade Canon camera set at shutter speed one/sixty seconds, focal length 90 to 105 mm, f/16 f stop, ISO 200. Photographs were taken at weekly intervals before the beginning of the next session without any make up on and analysis was done based on the Modified Fitzpatrick Wrinkle Scale. The wrinkle scale reading corresponding to forehead wrinkles, crow's feet, nasolabial folds and marionette lines were taken into consideration. Micro-needling was done after the application of a topical anaesthetic agent and PRP derived from centrifuging the blood of the patient along with freshly made hyaluronic acid was deposited during micro-needling using one ml disposable syringes. The patients were advised to use a gentle cleanser only for the face and neck and apply a medical-grade sunscreen with SPF 40 every day without fail.

### Modified Fitzpatrick Wrinkle scale [MFWS]:

#### Score discretion

- 0 No wrinkle, no visible wrinkle, a continuous skin line.
- 0.5 Very shallow yet visible wrinkle.
- 1 Fine wrinkle, visible wrinkle and slight indentation.
- 1.5 Visible wrinkle and clear indentation [wrinkle depth < 1 mm].
- 2 Moderate wrinkle, clearly visible wrinkle [wrinkle depth of 1 - 2 mm].
- 2.5 Prominent and visible wrinkle [wrinkle depth > 2 mm and < 3 mm].
- 3 Deep wrinkle, deep and furrow wrinkle [wrinkle depth > 3 mm].

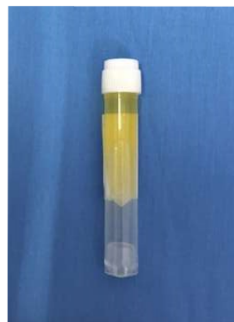
### Results

On analysing the photographs of the fifty patients everyone showed visible improvement in her wrinkle scale right from the second session onwards. All the patients belonging to ages twenty-five to forty years had no visible wrinkles by the end of the sixth session. Only two patients whose age was nearing fifty showed very shallow or fine lines by the end of the study which also were reduced to no visible levels by the end of two additional sessions. Healing was satisfactory no complications developed through the course of the treatment.

### Discussion

One of the main signs of skin ageing is wrinkle formation. Decreased fibroblast production in ageing skin leads to decreased collagen formation and increased production of matrix metalloproteinases, especially MMP 1 causing wrinkle formation [1]. Micro-needling does not induce post-inflammatory hyperpigmentation in skin of colour when compared to chemical peels and laser therapy [2]. Platelet-rich plasma promotes the release of higher concentrations of growth factors thereby increasing neo-angiogenesis and collagen production

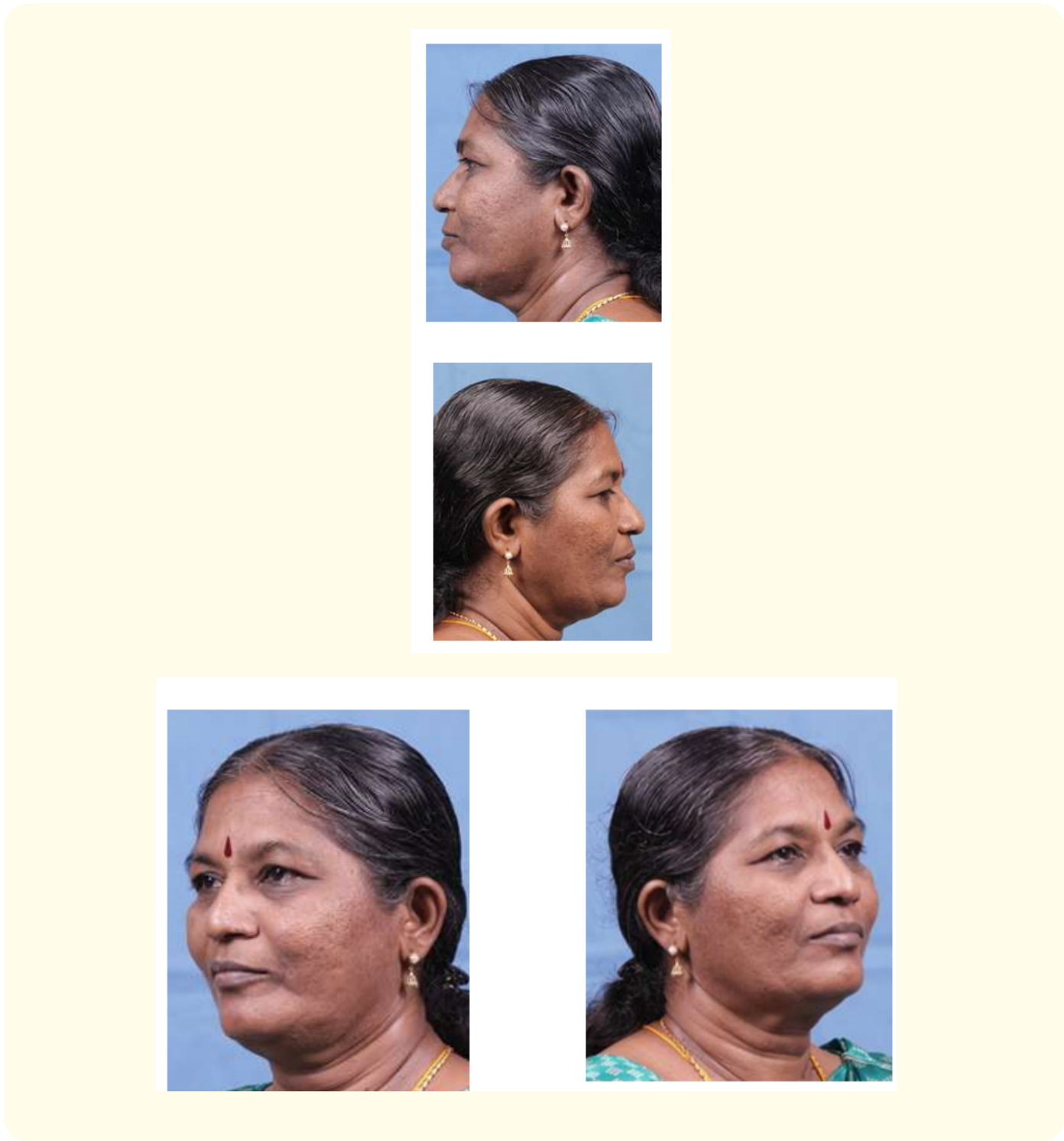
Photographs taken before session one



Pictures showing PRP obtained from the patient and micro needling being done



Photographs taken after session six



Patient no	Age in Years	Session 1				Session 2				Session 3				Session 4				Session 5				Session 6			
		Fore head	Crows feet	Naso labial fold	Mario nette lines	Fore head	Crows feet	Naso labial fold	Mario nette lines	Fore head	Crows feet	Naso labial fold	Mario nette lines	Fore head	Crows feet	Naso labial fold	Mario nette lines	Fore head	Crows feet	Naso labial fold	Mario nette lines	Fore head	Crows feet	Naso labial fold	Mario nette lines
1	25	0	1	1.5	1	0	0	1	0.5	0	0	1	0.5	0	0	0.5	0.5	0	0	0	0	0	0	0	0
2	25	0	2	2.5	1	0	1.5	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0	0
3	25	0	1.5	1.5	0.5	0	1	1	0	0	0.5	0.5	0	0	0.5	0.5	0	0	0	0.5	0	0	0	0	0
4	26	0	1	1.5	1.5	0	0	1	0.5	0	0	1	0.5	0	0	0.5	0.5	0	0	0	0	0	0	0	0
5	26	0	2	2.5	1	0	1.5	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0	0
6	27	0	2	2	1	0	1.5	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0	0
7	27	0	1.5	1.5	0.5	0	1	1	0	0	0.5	0.5	0	0	0.5	0.5	0	0	0	0.5	0	0	0	0	0
8	27	0	2	2.5	1	0	1.5	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0	0
9	29	0	2.5	2.5	1	0	2	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0	0
10	29	0	1.5	1.5	1.5	0	1	1	1	0	0.5	0.5	1	0	0.5	0.5	0.5	0	0	0.5	0.5	0	0	0.5	0
11	30	0.5	2	2.5	1	0	1.5	2	0.5	0	1.5	2	0.5	0	1	1	0	0	0.5	0.5	0	0	0	0.5	0
12	30	1	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
13	30	1	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	2	1.5	0	0.5	1.5	0	0	0	1	0
14	31	1	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
15	31	1	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
16	31	1.5	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	1	0
17	31	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
18	33	1	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
19	35	1	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
20	36	1.5	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
21	37	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
22	37	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
23	38	1.5	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1.5	1	1.5	0	0.5	0.5	0	0	0	1	0
24	38	0.5	2.5	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0	0
25	38	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
26	39	0.5	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
27	39	1	2.5	3	1	0.5	2.0	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
28	40	1.5	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
29	40	0.5	2.5	3	1	0.5	2.5	2.5	0.5	0	2.0	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
30	40	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
31	41	1.5	2	3	1	1	1.5	2.5	2.0	0	1.5	2	1.5	0	1.5	1	1.5	0	0.5	0.5	0	0	0	1	0
32	41	1	2.5	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0	0
33	42	1.5	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0.5	0	0
34	43	0.5	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
35	44	1	2.5	2.5	1	0.5	2.0	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0.5	0
36	44	1.5	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
37	45	1.5	2.5	2.0	2.0	1.0	2.5	2.5	1.5	0	2.0	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0.5	0.5	0
38	45	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
39	45	1.5	2	3	1	1	1.5	2.5	2.0	0	1.5	2	1.5	0	1.5	1	1.5	0	0.5	0.5	0	0	0	1	0
40	46	1	2.5	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0	0
41	46	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
42	46	0.5	2	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
43	46	1	2.5	3	1	0.5	2.0	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0.5	0	0
44	47	1.5	2	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1	1.5	0	0.5	0.5	0	0	0	0	0
45	47	0.5	2.5	3	1	0.5	2.5	2.5	0.5	0	2.0	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
46	47	1	2.5	3	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0	0.5	0
47	48	1.5	2	3	1	1	1.5	2.5	2.0	0	1.5	2	1.5	0	1.5	1	1.5	0	0.5	0.5	0	0	0	1	0
48	50	1	2.5	2.5	1	0.5	1.5	2.5	0.5	0	1.5	2	0.5	0	1	1.5	1.5	0	0.5	0.5	0	0	0.5	0	0
49	50	1.5	2	3	1	1	1.5	2.5	2.0	0	1.5	2	1.5	0	1.5	1	1.5	0	0.5	0.5	0	0	1	0.5	0
50	50	1.5	2.5	3	2.5	1	1.5	2.5	1.5	1.5	1.5	1.5	0.5	0.5	1.5	1.5	1.5	0.5	0.5	1.5	0.5	0	1	0.5	0.5

Table 1: Table showing wrinkle scale reading of patients following each session.

[3,7]. Combining these two with hyaluronic acid in my study has proven to be a successful treatment option for treating signs of ageing, especially in terms of wrinkle and skin sag reduction [4]. Along with wrinkle reduction and visible improvement in skin sag on the face, most of the patients also achieved more even-toned skin, clearer skin, visible reduction in pore size and acne scar depth, scar tissue tightness and scar pigmentation reduction [5,6]. Since these improvements are due to the quality of collagen being laid down following micro needling which is collagen types I, III, and VII, newly synthesized collagen, together with tropoelastin the results are long-standing [7,8]. In India where the climate is hot and humid and most people are working around the clock it is difficult to follow an extensive skincare regimen every day. Specific post-operative care following deep peels, lasers, fillers and botox is much more difficult to follow even when the appointments are very well planned in late evenings and well in advance. This new approach of micro-needling and PRP with hyaluronic acid reduces the need for extensive post-op care as the downtime is hardly a few hours and the patients are very comfortable while carrying out their regular routine. Since the results are permanent the need for more extensive skincare and makeup every day is nullified. Combining PRP which is rich in growth factors, with micro needling has significantly increased the post operative healing rate [9]. Since post-operative complications are much lesser in patients this is a revolutionary combination therapy in the history of anti ageing skin care.

Conclusion

Micro-needling combined with PRP and hyaluronic acid proves to be a promising anti ageing regimen providing holistic results by doing damage reversal, maintenance and prevention of accelerated collagen breakdown.

### Author Contribution

Dr. Thenaruvi Marimuthu: Conceptualization, methodology, data curation, writing-original draft preparation, visualization, investigation, writing-reviewing and editing.

### Conflict of Interest

None.

### Funding Sources

Author's own funding.

### Ethics Approval

Obtained.

### Bibliography

1. GJ F., *et al.* "Collagen fragmentation promotes oxidative stress and elevates matrix metalloproteinase-1 in fibroblasts in aged human skin". *The American Journal of Pathology* 174 (2009): 101-114.
2. BEC NE. "Microneedling in skin of color: A review of uses and efficacy". *Journal of the American Academy of Dermatology* 72.2 (2016): 348-355.
3. GL P. "Platelet-Rich Plasma for Skin Rejuvenation: Facts, Fiction, and Pearls for Practice". *Facial Plastic Surgery Clinics of North America* 27.3 (2019): 405-411.
4. BG U. "Platelet-rich plasma and hyaluronic acid - an efficient biostimulation method for face rejuvenation". *Journal of Cosmetic Dermatology* 16.1 (2017): 112-119.
5. M A., *et al.* "Efficacy and tolerability of a microneedling device for treating wrinkles on the face". *Journal of Cosmetic Dermatology* 22.1 (2023): 206-213.
6. N M., *et al.* "Microneedling as a Treatment for Acne Scarring: A Systematic Review". *Dermatologic Surgery* 46.1 (2020): 86-92.
7. M E-D., *et al.* "Multiple microneedling sessions for minimally invasive facial rejuvenation: an objective assessment". *International Journal of Dermatology* 54.12 (2015): 1361-1369.
8. CE W., *et al.* "A Single-Center Trial to Evaluate the Efficacy and Tolerability of Four Microneedling Treatments on Fine Lines and Wrinkles of Facial and Neck Skin in Subjects with Fitzpatrick Skin Types I-IV: An Objective Assessment Using Noninvasive Devices and 0.33-mm Microbiopsies". *Aesthetic Surgery Journal* 41.11 (2021): NP1603-NP1618.
9. J L and AP S. "Platelet-rich plasma for skin rejuvenation and tissue fill". *Facial Plastic Surgery Clinics of North America* 26.4 (2018): 439-446.

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