Original Article
PJMSA Journal
www.PJMSA.com

Pakistan Journal of Medical & Surgical Aesthetics
2025;1(4):135-139

Subcision combined with Platelet-Rich Plasma versus subcision combined with autologous biofiller for atrophic acne scars: A randomized prospective clinical study

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Abstract

Objective: To compare the clinical efficacy and patient satisfaction outcomes of subcision combined with platelet-rich plasma versus subcision combined with autologous plasma biofiller in patients with moderate to severe atrophic acne scars.

Methods: This randomized prospective clinical study included 56 patients aged 18-40 years presenting with moderate to severe atrophic acne scars. Patients were randomly allocated into two equal groups of 28 each. Group A received subcision combined with PRP, while Group B received subcision combined with autologous biofiller. Three treatment sessions were conducted at four-week intervals. Clinical outcomes were assessed using the Goodman and Baron qualitative grading system at baseline, three months, and six months. Patient satisfaction scores were also recorded.

Results: At six months follow-up, the biofiller group demonstrated significantly greater improvement compared to the PRP group. Mean percentage improvement was 57.8±12.4% in the PRP group and 71.9±10.6% in the biofiller group (p=0.0008). Rolling scars showed the highest responsiveness in both groups. Patient satisfaction scores were higher in the biofiller group. Mild erythema and bruising were observed in both groups but resolved without complications.

Conclusion: Subcision combined with autologous plasma biofiller provides superior clinical improvement and patient satisfaction compared to subcision combined with PRP, making it a safe and effective treatment option for moderate to severe atrophic acne scars.

Keyword: Acne scars; PRP; Biofillers; Subscion.

Received: March 11, 2026 | **Revised:** April 08, 2026 | **Accepted:** April 15, 2026 | **Published:** April 20, 2026

Citation: Qaisrani FH. Subcision combined with Platelet-Rich Plasma versus subcision combined with autologous biofiller for atrophic acne scars: A randomized prospective clinical study. *Pak J Med Surg Aesthet*. 2025;**1(4)**:135-139.

Introduction

Atrophic acne scars are a common sequela of acne vulgaris and represent a significant cosmetic and psychosocial concern for affected individuals.[1] These scars result from inflammatory destruction of dermal collagen followed by abnormal wound healing and fibrosis.[2] Subcision is a well-established minimally invasive technique that releases fibrotic strands responsible for dermal tethering.[3] However, subcision alone may lead to recurrence due to reattachment of

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fibrous bands.[4] Adjunctive therapies such as platelet-rich plasma (PRP) and autologous plasma biofiller have been increasingly utilized to enhance tissue regeneration and provide volumetric support.[5,6] PRP stimulates collagen synthesis through growth factor release,[7] while autologous biofiller provides mechanical elevation along with regenerative effects.[8]

Acne vulgaris is one of the most prevalent dermatological disorders worldwide, affecting approximately 80-90% of adolescents and young adults.[2] Although active acne lesions may resolve with treatment, but permanent scarring remains a frequent complication.[11] Atrophic acne scars are the most common type of acne scars and occur as a result of dermal inflammation and collagen destruction during the healing phase of inflammatory acne lesions.[11] These scars can significantly affect cosmetic appearance, self-esteem, and overall quality of life.[12]

Atrophic acne scars are typically classified into rolling, boxcar, and ice-pick types based on morphology.[2] Rolling scars are characterized by shallow depressions with sloping edges and are primarily caused by fibrous dermal tethering.[2] Boxcar scars have well-defined edges and varying depths, while ice-pick scars are narrow and deep.[2] Treatment outcomes vary depending on scar type, making individualized treatment strategies essential.[1]

Subcision is a widely accepted surgical technique used to treat tethered scars.[3] The procedure involves inserting a needle or cannula beneath the skin to release fibrotic strands anchoring the dermis to underlying tissue.[3] This mechanical release promotes collagen deposition and improves skin texture.[4] However, subcision alone may not provide sustained improvement because fibrotic bands can reform during healing.[4]

To enhance outcomes, regenerative therapies such as platelet-rich plasma have been widely used.[7] PRP is derived from autologous blood and contains high concentrations of platelets rich in growth factors including platelet-derived growth factor, transforming growth factor-beta, and vascular endothelial growth factor.[7] These factors stimulate fibroblast proliferation and collagen synthesis, thereby improving tissue repair.[7]

Autologous plasma biofiller is a relatively newer technique that provides both regenerative and volumetric benefits.[8] It is prepared by thermal gelation of platelet-poor plasma, forming a semi-solid scaffold that supports dermal tissue and maintains elevation of depressed scars.[8] Unlike synthetic fillers, autologous biofiller is biocompatible and associated with minimal risk of hypersensitivity reactions.[13]

Recent trends in aesthetic dermatology emphasize combination therapies that address multiple aspects of scar formation.[14] The combination of subcision with regenerative modalities such as PRP or biofiller is believed to improve clinical outcomes and patient satisfaction.[15] However, limited comparative studies have evaluated the relative effectiveness of these adjunctive therapies.[14] Therefore, this study was designed to compare the efficacy of subcision combined with PRP versus subcision combined with autologous biofiller.

Methods

This randomized prospective clinical study was conducted at QMC Multan. A total of 56 patients aged between 18 and 40 years presenting with moderate to severe atrophic acne scars were enrolled after obtaining informed consent.

Inclusion criteria included patients with stable acne, presence of moderate to severe atrophic scars, and willingness to complete follow-up visits. Exclusion criteria included active infection, keloidal tendency, pregnancy, systemic illness, and previous acne scar treatment within six months.

Patients were randomly assigned into two groups of 28 each using computer-generated randomization. Group

A received subcision combined with platelet-rich plasma, while Group B received subcision combined with autologous plasma biofiller.

PRP preparation was performed using a standardized double-spin centrifugation technique. Approximately 10 ml of venous blood was collected from each patient. The first centrifugation separated plasma from red blood cells, and the second centrifugation concentrated platelets to obtain platelet-rich plasma.

Autologous biofiller preparation involved heating platelet-poor plasma at controlled temperature to form a gel-like consistency. The prepared biofiller was homogenized before injection.

Subcision was performed using a 22-gauge blunt cannula under local anesthesia. Fibrotic strands were released through controlled back-and-forth movements beneath the scar tissue.

In subcision, the use of a blunt-tipped cannula instead of a sharp needle is primarily driven by safety and precision. A sharp needle cuts through tissue indiscriminately, increasing the risk of vascular injury, nerve damage, and hematoma formation. In contrast, a blunt cannula is designed to separate fibrous septae by gliding along natural tissue planes rather than piercing vessels or nerves. This reduces complications and makes the procedure more controlled, especially in areas with dense vascular networks such as the face.

Another advantage is patient comfort. Cannulas require fewer entry points and cause less trauma to surrounding tissue, which translates into reduced bruising, swelling, and downtime. Their flexibility allows smoother navigation beneath the dermis, ensuring a more uniform release of tethered scars.

Overall, blunt cannulas enhance the reproducibility of subcision, improve patient safety, and optimize outcomes. Their adoption reflects a refinement of technique that balances efficacy with minimized risk, which is why they are increasingly favored in both clinical practice and research.

Three treatment sessions were performed at four-week intervals. Clinical evaluation was conducted at baseline, three months, and six months using Goodman and Baron qualitative grading scale.[1]

Patient satisfaction was recorded using standardized scoring.

Results

Mild erythema and bruising were the most common adverse effects observed in both groups. These side effects resolved within one week. No major complications were recorded.[16]

All 56 patients completed the study period without dropout. The mean age of participants was approximately 26.8 years.

Rolling scars were the most common scar type observed among participants **(Table 1)**. Percentage of patients with different scar types treated is shown in **(Figure 1)**.

Table 1 Baseline patient characteristics.

Characteristic	*PRP Group (n=28)*	*Biofiller Group (n=28)*
Mean Age (years)	26.4±4.2	27.1±3.9
Male	12	11
Female	16	17
Rolling scars (%)	50	54
Boxcar scars (%)	32	29
Ice-pick scars (%)	18	17

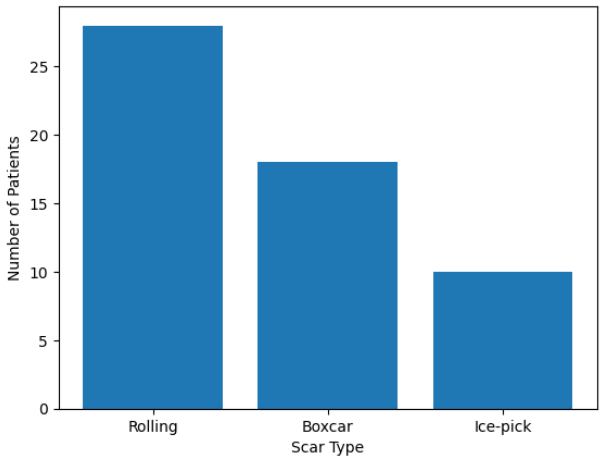

Figure 1 Scar type distribution.

Table 2 Clinical Outcome Comparison

Outcome	*PRP Group*	*Biofiller Group*	*p-value*
Mean Improvement (%)	57.8 ± 12.4	71.9 ± 10.6	0.0008
Patient satisfaction (%)	68	86	<0.05
Adverse Effects	Mild erythema	Mild erythema	NS

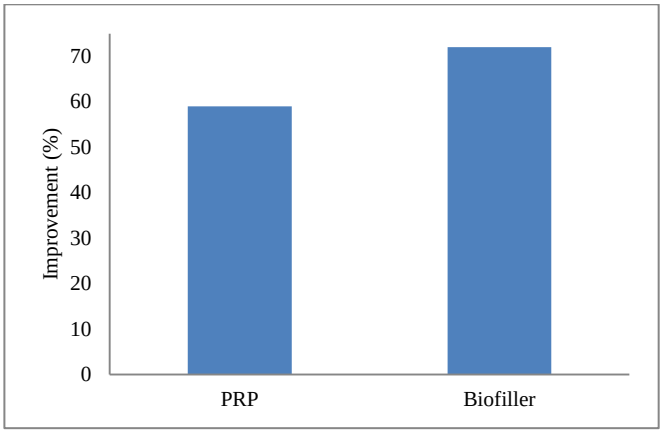

Figure 2 Mean percentage improvement at 6 months

Comparison of clinical outcomes of both PRP and Biofiller groups is shown in **(Table 2)** while mean percentage of improvement at 6th month is shown in **(Figure 2)**.

Significant improvement in scar appearance was observed in both groups after treatment. However, the biofiller group demonstrated greater improvement compared to the PRP group.

Mean percentage improvement at six months was 57.8±12.4% in the PRP group and 71.9±10.6% in the biofiller group. Statistical analysis revealed a significant difference between the two groups (p=0.0008).

Patient satisfaction scores were also higher in the biofiller group compared to the PRP group.

Rolling scars were the most common scar type observed among participants.

Discussion

The findings of this study demonstrate that subcision combined with autologous biofiller provides superior clinical improvement compared to subcision combined with PRP alone.[15] The enhanced results observed in the biofiller group may be attributed to its dual mechanism of action, which includes both volumetric support and stimulation of collagen synthesis.[8]

PRP has been widely used in dermatology due to its regenerative properties.[7] Growth factors present in PRP stimulate fibroblast proliferation and promote collagen deposition.[7] However, PRP alone does not provide sustained mechanical support, which may limit long-term improvement in certain scar types.[14]

Autologous biofiller acts as a scaffold that maintains dermal elevation and prevents reattachment of fibrotic strands.[8] This sustained support contributes to improved scar appearance and higher patient satisfaction.[15] The autologous nature of biofiller also reduces the risk of allergic reactions and enhances safety.[13]

The safety profile observed in this study was favorable, with only mild transient side effects reported. These findings support the use of combination therapies as an effective approach in acne scar management.[16]

Limitations of this study include the relatively small sample size and single-center design. Longer follow-up periods and multicenter studies are recommended to further validate these findings.[14]

Conclusion

Subcision combined with autologous plasma biofiller demonstrates superior clinical efficacy and patient satisfaction compared to PRP alone. This combination therapy offers a safe, and effective treatment option for patients with moderate to severe atrophic acne scars.[15,19]

Financial support and sponsorship None.

Conflict of interest The author affirms that he has no conflicts of interest to disclose.

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