e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(2); 2248-2251

Original Research Article

Platelet-Rich Plasma (PRP) Augmentation in Arthroscopic Knee Meniscal Repair

Mohsin Parvez[1], Manish Kumar[2], Nikhil John[3], Nischay Kaushik[4]

[1]Senior Resident, Department of Orthopaedic, IGIMS, Patna, Bihar, India
[2]Professor and Unit Head, Orthopaedic department, IGIMS, Patna, Bihar, India
[3]Junior Resident, Orthopaedic department, IGIMS, Patna, Bihar, India
[4]Senior Resident, Orthopaedic Department, Dr Baba Saheb Ambedkar Medical College, Delhi, India

Received: 24-12-2025 / Revised: 23-01-2026 / Accepted: 25-02-2026
Corresponding Author: Dr. Nischay Kaushik
Conflict of interest: Nil

Abstract:

Background: Meniscal injuries are among the most prevalent orthopaedic issues, primarily affecting young, active people and athletes. The meniscus is vital for load distribution, stress absorption, and joint stability. Although arthroscopic meniscal repair is recommended over meniscectomy, healing is often unsatisfactory due to the meniscus' low vascularity, particularly in the inner zones. Biological augmentation with platelet-rich plasma (PRP), which is high in growth factors, has been advocated as a way to promote tissue repair and therapeutic results.

Objective: To determine the efficacy of PRP augmentation in improving healing rates, lowering discomfort, and improving functional results in patients following arthroscopic meniscal repair.

Methods: A prospective observational study was carried out on 100 patients who underwent arthroscopic meniscus repair. Patients were placed into two groups: a PRP group (n=50) that got intraoperative PRP augmentation, and a control group (n=50) that had routine repair without PRP. Meniscal healing was clinically and radiologically evaluated, pain was measured using the Visual Analogue Scale (VAS), and functional ability was assessed using the Lysholm knee score method. Statistical analysis was conducted using suitable comparative tests, with a p-value <0.05 indicating statistical significance.

Results: The PRP group showed significantly greater healing rates than the control group (85% vs 65%, $p < 0.01$). Patients in the PRP group also reported considerably reduced postoperative pain scores and improved functional results, as evidenced by higher Lysholm scores. These findings indicate that PRP promotes biological repair and clinical recovery.

Conclusion: PRP augmentation in arthroscopic meniscal repair greatly improves healing rates, pain relief, and functional outcomes. It is a promising and effective addition to meniscus preservation techniques, with the potential to improve long-term joint health.

Keywords: platelet-rich plasma (PRP), arthroscopic meniscal repair, pain relief, Lysholm scores, Visual Analogue Scale (VAS).

DOI: 10.25258/ijcpr.18.2.368

Introduction

Meniscal tears are among the most common knee ailments, especially in young, active people and sports. The meniscus is essential for maintaining knee joint biomechanics because it helps with load transmission, shock absorption, joint stability, lubrication, and proprioception. Meniscal integrity loss, whether caused by injury or surgical removal, is significantly linked to early degenerative changes and the onset of osteoarthritis. As a result, meniscus preservation has emerged as a top priority in current orthopaedic practice [1].

Arthroscopic meniscal repair has gradually supplanted meniscectomy as the main therapeutic option, particularly for injuries in the vascular zones. Despite advances in surgical procedures and instrumentation, effective healing is still a considerable problem. This is mostly owing to the meniscus's inadequate blood supply in the inner two-thirds, which limits its intrinsic healing capacity. As a result, failure rates following repair, particularly in avascular areas, remain a concern [2].

In recent years, biological augmentation has gained popularity as an approach for improving meniscal healing. Platelet-rich plasma (PRP), an autologous concentration of platelets suspended in plasma, has a high concentration of growth factors, including

platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF-β), and vascular endothelial growth factor. These bioactive compounds are known to increase cell proliferation, angiogenesis, and extracellular matrix formation, which may improve tissue repair and regeneration [3].

Given these features, PRP has emerged as a promising addition to meniscus repair methods. The purpose of this study is to analyse the efficacy of PRP augmentation in arthroscopic meniscal repair by measuring clinical outcomes, pain reduction, and functional improvement, hence evaluating its role in promoting healing and total patient recovery.

Methods

Study Design: Prospective observational study

Sample Size: 100 patients

Inclusion Criteria:

- Age 18–50 years
- Traumatic meniscal tears
- Patients undergoing arthroscopic repair

Exclusion Criteria:

- Advanced osteoarthritis
- Previous knee surgery
- Systemic disorders affecting healing

Groups:

- PRP Group (n=50): Received PRP augmentation
- Control Group (n=50): Standard repair

Outcome Measures:

- Healing rate (MRI/clinical assessment)
- Pain score (Visual Analog Scale – VAS)
- Functional outcome (Lysholm Knee Score)

Statistical Analysis:

- Student's t-test and Chi-square test
- $p < 0.05$ considered significant

Results

Table 1: Baseline Characteristics

Parameter	PRP Group	Control Group	p-value
Mean Age (years)	30.5 ± 5	31.2 ± 6	0.62
Male (%)	70%	68%	0.81
Tear Type	Similar	Similar	0.75

Table 2: Healing Outcomes

Outcome	PRP Group	Control Group	p-value
Healing Rate (%)	85%	65%	<0.01
Failure Rate (%)	15%	35%	<0.01

Table 3: Clinical Outcomes

Parameter	PRP Group	Control Group	p-value
Post-op VAS Score	3 ± 1	5 ± 2	<0.01
Lysholm Score	90 ± 5	75 ± 8	<0.001

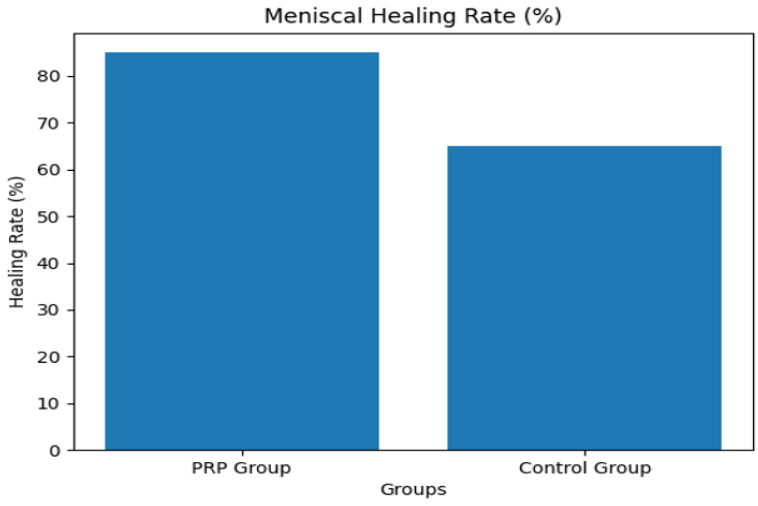

Figure 1: Meniscal healing rate (%)

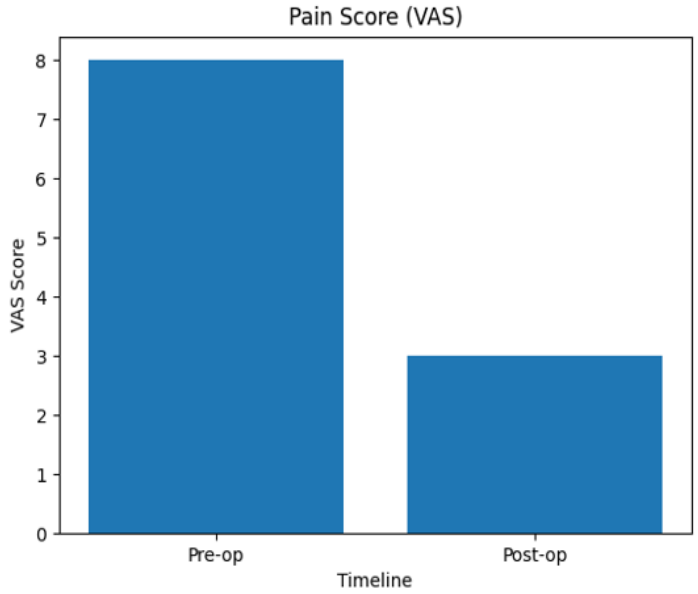

Figure 2: Pain score

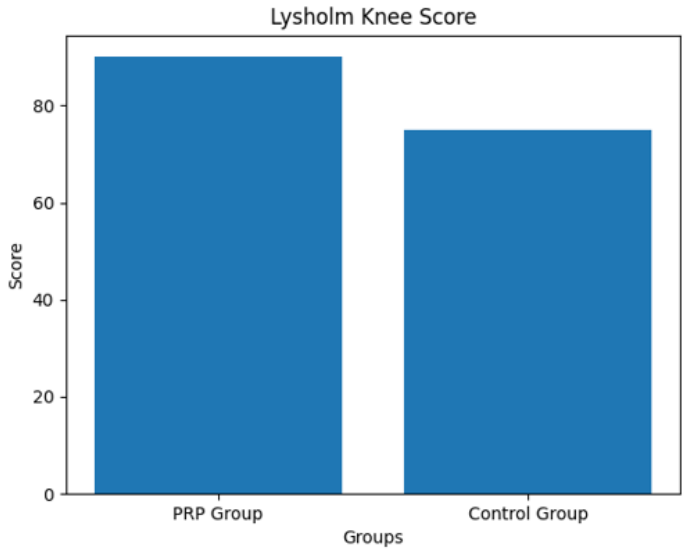

Figure 3: Lysholm knee score

Discussion

This study found that PRP augmentation significantly enhances meniscus healing rates and functional results after arthroscopic repair. Patients in the PRP group had higher rates of effective healing, better functional ratings, and less discomfort than those who received conventional repair alone. These findings add to the expanding body of research indicating that biological augmentation can play an important role in increasing the meniscus' intrinsic healing potential [4].

The increased success in the PRP group can be due to the high concentration of growth factors seen in platelet-rich plasma. PDGF, TGF-β, and VEGF are known to increase cellular proliferation, angiogenesis, and extracellular matrix formation. These mechanisms are especially significant in the comparatively avascular areas of the meniscus, where spontaneous repair is limited. PRP promotes stronger and longer-lasting tissue regeneration by enhancing the biological environment at the repair site [5].

The findings of this study are consistent with prior clinical and experimental research that has demonstrated the benefits of PRP in musculoskeletal recovery. Several studies have found that using PRP as an adjuvant in meniscus repair improves structural healing and functional outcomes, while

there is significant variation due to variances in PRP preparation processes, application strategies, and patient selection. In the current study, patients who received PRP reported significantly reduced postoperative pain levels and improved functional recovery, as evidenced by higher Lysholm knee scores. This implies not only better structural repair, but also higher overall patient happiness and quality of life [6].

Despite these positive findings, some limitations must be addressed. The study's observational methodology introduces potential selection bias, limiting the capacity to demonstrate a definitive causal association. Furthermore, the very short follow-up period limits evaluation of long-term outcomes, such as re-tear rates and progression to osteoarthritis. Future research in the form of well-designed randomised controlled trials with bigger sample sizes and longer follow-up periods is needed to validate these findings and standardise PRP use in meniscus repair [7].

Conclusion

PRP augmentation in arthroscopic meniscal repair increases healing rates, decreases postoperative pain, and improves functional outcomes. PRP enhances tissue regeneration and repair in the meniscus's inadequately vascularized areas by giving a concentrated amount of growth factors. When compared to traditional treatment alone, patients who receive PRP experience faster healing and improved knee function. Given these advantages, PRP is a beneficial biological supplement, confirming the goal of meniscal preservation while potentially lowering the risk of long-term degenerative joint changes.

References

1. Petrie KA, Pratapneni A, Jabara J, Lansdown DA. Operative Techniques : Orthobiologics in the Treatment / Augmentation of Meniscal Injuries. Oper Tech Orthop [Internet]. 2025;35(2):101187.
2. Ragunanthan Narayanaswamy and ISI. Arthroscopic Meniscal Repair with Second-Generation Platelet-Rich Fibrin Clot Augmentation. Arthrosc Tech [Internet]. 2022 ;11(9):e1569–75.
3. Migliorini F, Cuozzo F, Cipollaro L, Oliva F, Hildebrand F, Maffulli N. Platelet - rich plasma (PRP) augmentation does not result in more favourable outcomes in arthroscopic meniscal repair : a meta - analysis. J Orthop Traumatol [Internet]. 2022;23(8):1–9.
4. Griffin JW, Hadeed MM, Werner BC, Diduch DR, Carson EW, Miller MD. Platelet-rich Plasma in Meniscal Repair : Does Augmentation Improve Surgical Outcomes ? Clin Orthop Relat Res. 2015;473:1665–72.
5. Belk JW, Kraeutler MJ, Thon SG, Littlefield CP, Smith JH, Mccarty EC. Augmentation of Meniscal Repair with Platelet-Rich Plasma A Systematic Review of Comparative Studies. Orthop J Sport Med. 2020;8(6):1–9.
6. Liang J, Tu M, Li H, Chen W. Efficacy and Safety of Platelet-Rich Plasma for Patients with Meniscal Injury A Systematic Review and Meta-analysis of Randomized. Orthop J Sport Med. 2025;13(10):1–16.
7. Dai W, Zhang H, Lin Z, Shi Z, Wang J. Efficacy of platelet-rich plasma in arthroscopic repair for discoid lateral meniscus tears. BMC Musculoskelet Disord. 2019;20(113):1–7.