



Comparative Effectiveness of Platelet-Rich Plasma Injections Versus Arthroscopic Lavage in Knee Osteoarthritis: A Prospective Study

Dr. Vivesh Kumar Singh, Dr. Piyush Agarwal, Dr. Zaveri Badal Prakashbhai

Department of Orthopaedics, Pacific Medical College, Udaipur, India

***Corresponding Author:**

Dr. Vivesh Kumar Singh

MS (Orthopaedics), Assistant Professor, Department of Orthopaedics,

Pacific Medical College, Udaipur, India

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Knee osteoarthritis (OA) is a prevalent degenerative condition with limited non-surgical treatment options. Platelet-rich plasma (PRP) has recently emerged as a biologic therapy, whereas arthroscopic lavage has historically been used but remains controversial.

Objective: To compare the clinical outcomes of intra-articular PRP injections versus arthroscopic lavage in patients with knee OA.

Methods: A prospective comparative study was conducted on 32 patients with symptomatic radiographic knee OA. Sixteen patients received intra-articular PRP, and sixteen underwent arthroscopic lavage. Functional outcomes were measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and pain using the Visual Analog Scale (VAS) at baseline and six months. Statistical analysis included paired t-tests for intragroup comparisons and ANOVA for between-group differences.

Results: Both groups were comparable at baseline ($p > 0.05$). At six months, PRP led to a mean WOMAC improvement of 16.2 points and VAS reduction of 3.1 points, whereas arthroscopy improved WOMAC by 9.1 points and VAS by 2.0 points. Both groups showed statistically significant improvements from baseline ($p < 0.05$), but PRP demonstrated significantly greater improvements than arthroscopy ($p < 0.01$). No complications were recorded in either group.

Conclusion: PRP injections provide superior pain relief and functional improvement compared to arthroscopic lavage in knee OA, supporting their use as a preferred minimally invasive treatment in appropriately selected patients.

Keywords: Platelet-rich plasma, Arthroscopy, Osteoarthritis, Knee, WOMAC, VAS

Introduction

Knee osteoarthritis (OA) is one of the most common causes of chronic pain and disability worldwide. It results from progressive cartilage degeneration and joint inflammation, leading to impaired mobility and reduced quality of life [1]. While total knee replacement remains the definitive treatment in advanced disease, there is a pressing need for effective non-surgical strategies in earlier stages.

Arthroscopic lavage, once widely used, aims to relieve symptoms by mechanically clearing inflammatory debris. However, randomized controlled trials have shown limited or no long-term benefit in OA management [2,3].

In contrast, platelet-rich plasma (PRP), an autologous blood derivative rich in growth factors, has shown promise in promoting cartilage repair and reducing inflammation. Several clinical trials and meta-

analyses support its role in improving pain and function in knee OA [4–6].

Methods

Study design: Prospective comparative clinical study.
Population: Thirty-two patients with clinically and radiographically confirmed knee OA (Kellgren–Lawrence grade II–III), recruited from a tertiary care center.

Sample size: 32 patients (PRP = 16; Arthroscopy = 16).

Inclusion criteria: Adults aged 40–70 years with persistent knee pain for >6 months, not responding to conservative therapy.

Exclusion criteria: Previous intra-articular injections within the past six months, inflammatory arthritis, prior knee surgery, or severe OA (KL grade IV).

Interventions:

- PRP group: Patients received intra-articular PRP prepared from autologous blood under sterile conditions.

- Arthroscopy group: Patients underwent arthroscopic lavage with removal of loose bodies and irrigation of the joint cavity.

Outcome measures: WOMAC and VAS scores were recorded at baseline and six months.

Statistical analysis: Paired t-tests were used for intragroup changes; ANOVA was performed for between-group comparison. A p-value <0.05 was considered statistically significant.

Results

Baseline characteristics: Both groups were similar in age, sex distribution, and baseline WOMAC and VAS scores ($p>0.05$) (Table 1).

Table 1. Baseline characteristics of study participants

Variable	PRP (n=16)	Arthroscopy (n=16)	p-value
Age (years, mean $\pm$ SD)	57.2 $\pm$ 8.5	58.3 $\pm$ 9.2	0.71
Gender (M/F)	7 / 9	6 / 10	0.74
BMI (kg/m ² , mean $\pm$ SD)	27.8 $\pm$ 3.1	28.2 $\pm$ 3.4	0.63
KL grade II / III	9 / 7	8 / 8	0.72
Baseline WOMAC	63.5 $\pm$ 8.9	64.1 $\pm$ 9.2	0.82
Baseline VAS	7.4 $\pm$ 1.1	7.3 $\pm$ 1.2	0.88

Clinical outcomes: At six months, the PRP group showed a mean WOMAC improvement of 16.2 points and VAS reduction of 3.1 points. The arthroscopy group improved by 9.1 points in WOMAC and 2.0 points in VAS. Both groups achieved statistically significant improvements from baseline ($p<0.05$). Between-group comparisons confirmed PRP was significantly superior to arthroscopy ($p<0.01$) (Table 2).

Table 2. Change in WOMAC and VAS scores from baseline to 6 months

Outcome	PRP (n=16)	Arthroscopy (n=16)	Mean Difference	p-value
WOMAC (baseline)	63.5 ± 8.9	64.1 ± 9.2	–	0.82
WOMAC (6 months)	47.3 ± 9.1	55.0 ± 8.8	-7.7	0.009
WOMAC change (Δ)	-16.2 ± 4.2	-9.1 ± 3.9	-7.1	<0.01
VAS (baseline)	7.4 ± 1.1	7.3 ± 1.2	–	0.88
VAS (6 months)	4.3 ± 1.0	5.3 ± 1.1	-1.0	0.011
VAS change (Δ)	-3.1 ± 0.9	-2.0 ± 0.8	-1.1	<0.01

Complications: No adverse events were reported in either group.

Discussion

This study demonstrates that intra-articular PRP injections are more effective than arthroscopic lavage in relieving pain and improving function in patients with knee OA. Arthroscopic lavage, while minimally invasive, provided only modest benefit, consistent with earlier randomized controlled trials that showed little or no advantage of arthroscopy in OA [2,3]. In contrast, PRP demonstrated clinically meaningful improvements, which aligns with evidence from randomized trials and meta-analyses demonstrating its superiority over placebo and hyaluronic acid in knee OA [4–6].

Our findings support the growing body of evidence advocating biologic therapies over traditional arthroscopic interventions in OA. This perspective is consistent with current OA management guidelines, which recommend against arthroscopy as a routine treatment and highlight the role of regenerative therapies as emerging options [1].

Conclusion

PRP injections provide superior clinical benefits compared to arthroscopic lavage in the management of knee OA, offering a safe and effective minimally

invasive alternative before surgical replacement is considered.

References

1. Bennell KL, Hunter DJ, Hinman RS. Management of osteoarthritis of the knee. *BMJ*. 2012;345:e4934. doi:10.1136/bmj.e4934
2. Kirkley A, Birmingham TB, Litchfield RB, et al. A randomized trial of arthroscopic surgery for osteoarthritis of the knee. *N Engl J Med*. 2008;359(11):1097–1107. doi:10.1056/NEJMoa0708333
3. Moseley JB, O'Malley K, Petersen NJ, et al. A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *N Engl J Med*. 2002;347(2):81–88. doi:10.1056/NEJMoa013259
4. Kon E, Mandelbaum B, Buda R, Filardo G, Delcogliano M, Timoncini A, Fornasari PM, Marcacci M. Platelet-rich plasma intra-articular injection versus hyaluronic acid viscosupplementation as treatments for cartilage pathology: From early degeneration to osteoarthritis. *Arthroscopy*. 2011;27(11):1490–1501. doi:10.1016/j.arthro.2011.05.011

5. Patel S, Dhillon MS, Aggarwal S, Marwaha N, Jain A. Treatment with platelet-rich plasma is more effective than placebo for knee osteoarthritis: A prospective, double-blind, randomized trial. *Am J Sports Med.* 2013;41(2):356–364. doi:10.1177/0363546512471299
6. Laudy ABM, Bakker EWP, Rekers M, Moen MH. Efficacy of platelet-rich plasma injections in osteoarthritis of the knee: A systematic review and meta-analysis. *Br J Sports Med.* 2015;49(10):657–672. doi:10.1136/bjsports-2014-094036