International Journal of Medicine
pISSN 1468-3814 | eISSN 2667-7008
https://theinternationalmedicine.com/

Original Researcher Article *DOI: 10.61336/im/26-04-94*

Comparison of Patellar Resurfacing Versus Non-Resurfacing in Primary Total Knee Arthroplasty: A Prospective Comparative Study

Dr Somshekhar[1]*, Dr Abhilash S[2], Dr Irfan Umar CP[3]

[1]*Senior Resident, Department of Orthopedics, ESIC Medical College and Hospital, Kalaburagi, RGUHS University, Bengaluru, Karnataka, India*

[2]*Cosultant Orthopaedic Surgeon, Department of Orthopaedics, Sai Hospitals.*

[3]*Cosultant Orthopaedic Surgeon,Department of Orthopaedics, STAR Hospital, Hyderabad, India.*

Abstract

Background: Patellar resurfacing during total knee arthroplasty (TKA) remains controversial. This study compared clinical and functional outcomes of patellar resurfacing versus non-resurfacing in primary TKA. ***Materials and Methods***: This prospective comparative study included 90 patients undergoing primary TKA, divided equally into resurfacing (n=45) and non-resurfacing (n=45) groups. Outcomes included Visual Analogue Scale (VAS), Knee Society Score (KSS), range of motion (ROM), anterior knee pain, satisfaction, and complications over 12 months. ***Results***: At 12 months, the resurfacing group had significantly lower VAS (1.5 ± 0.7 vs 2.1 ± 0.9; p<0.001), higher KSS (88.2 ± 5.5 vs 84.7 ± 6.0; p=0.005), and less anterior knee pain (8.9% vs 24.4%; p=0.048). ROM (118.4° vs 115.6°; p=0.076), satisfaction (88.9% vs 77.8%; p=0.157), and complication rates were comparable. ***Conclusion***: Patellar resurfacing was associated with lower postoperative pain and better functional outcome, while ROM, satisfaction, and complications were comparable between groups.

Correspondence:
Dr Somshekhar.
Senior Resident, Department of Orthopedics, ESIC Medical College and Hospital, Kalaburagi, RGUHS University, Bengaluru, Karnataka, India.

Received: 10-02-2026
Revised: 18-02-2026
Accepted: 10-03-2026
Published: 29-04-2026

INTRODUCTION

Total knee arthroplasty (TKA) is a widely performed and effective surgical procedure for patients with end-stage degenerative knee disease[1]. It aims to provide sustained pain relief, restore joint function and mobility, and improve quality of life in patients who remain symptomatic despite adequate conservative treatment.[2] Advances in prosthetic design, surgical techniques, perioperative care, and rehabilitation have substantially improved outcomes following TKA. Nevertheless, a proportion of patients continue to experience anterior knee pain and functional limitations after surgery, with patellofemoral joint-related factors contributing to these residual symptoms.[3,4]Although replacement of the femoral and tibial articular surfaces forms the fundamental component of TKA, management of the patella remains controversial.[3,5] The principal strategies include patellar resurfacing, in which the diseased patellar articular surface is replaced with a prosthetic component, and non-resurfacing, in which the native patellar surface is retained. Some surgeons have traditionally favored routine resurfacing, whereas others advocate preservation of the patella or selective resurfacing based on clinical and intraoperative findings.[6–8]Patellar resurfacing aims to eliminate the diseased articular surface and establish a prosthetic patellofemoral articulation. Its proposed benefits include reduction in postoperative anterior knee pain and a lower requirement for secondary patellar procedures.[9,10] However, resurfacing introduces an additional prosthetic component and may be associated with complications such as patellar fracture, component loosening or wear, altered patellar tracking, instability, osteonecrosis, and extensor mechanism-related complications.[3,5] Conversely, non-resurfacing preserves native patellar bone stock and avoids complications directly attributable to a patellar implant; however, retention of a degenerative patellar surface may contribute to persistent anterior knee pain and subsequent secondary resurfacing.[7,8]The choice between these approaches is influenced by several factors, including the severity of patellofemoral osteoarthritis, patellar cartilage quality and morphology, preoperative patellofemoral symptoms, patient

characteristics, implant design, surgical technique, and surgeon preference.[5,11] Consequently, considerable variation persists in clinical practice regarding routine, selective, or no patellar resurfacing.Evidence comparing the two strategies remains heterogeneous. Chen et al., in an updated meta-analysis of 32 randomized controlled trials involving 6,887 knees, reported lower overall and long-term reoperation rates with resurfacing, but no significant differences in anterior knee pain, range of motion, Oxford Knee Score, KOOS, visual analogue scale pain scores, or patient satisfaction.[12] Tang et al., analyzing 50 randomized controlled trials involving 5,586 knees, found lower patellar revision (RR 0.41), non-patellar revision (RR 0.64), and anterior knee pain with resurfacing.[13] A subsequent network meta-analysis of 50 randomized trials involving 9,283 patients similarly demonstrated lower reoperation and anterior knee pain rates with resurfacing, while functional scores, range of motion, and patient satisfaction were generally comparable.[14] More recently, a 2025 systematic review and meta-analysis of 49 studies found reduced anterior knee pain with resurfacing but no significant advantage in KSS function, pain scores, Oxford Knee Score, range of motion, or cost-effectiveness.[15]Thus, despite extensive investigation, uncertainty persists regarding the clinical advantage of routine patellar resurfacing over preservation of the native patella. The present prospective comparative study was therefore designed to compare patellar resurfacing versus non-resurfacing in primary TKA.

MATERIALS AND METHODS

Materials and Methods

This prospective comparative study was conducted in the Department of Orthopaedics,at tertiary care hospital. Patients undergoing primary total knee arthroplasty (TKA) who fulfilled the predefined eligibility criteria were enrolled.

Study Population

A total of 90 patients undergoing primary TKA were included. The participants were divided into two groups of 45 patients each according to patellar management during surgery:

Group A (n=45): TKA with patellar resurfacing.
Group B (n=45): TKA without patellar resurfacing.

Inclusion Criteria

Patients aged ≥50 years who underwent primary TKA for symptomatic primary osteoarthritis of the knee, with advanced radiological degenerative changes and persistent pain and functional limitation despite adequate conservative treatment, were eligible. Patients who were willing to participate and were available for the planned postoperative follow-up were included.

Exclusion Criteria

Patients undergoing revision TKA; those with inflammatory arthritis, previous major knee surgery, previous patellar fracture or patellar surgery, severe patellar deformity, active or recent knee joint infection, significant ligamentous instability requiring constrained implants, neuromuscular disorders affecting lower-limb function, or inability to comply with postoperative rehabilitation or follow-up were excluded.

Preoperative Assessment

A detailed history and clinical examination were performed for all patients. Demographic and clinical variables, including age, sex, body mass index, affected side, duration of symptoms, comorbidities, preoperative pain, knee range of motion (ROM), and functional status, were recorded. Standard weight-bearing anteroposterior, lateral, and patellofemoral radiographs of the knee were obtained. Baseline functional assessment was performed using the Knee Society Score (KSS), while pain was assessed using the Visual Analogue Scale (VAS).

Surgical Technique

All procedures were performed using a standardized primary TKA technique under appropriate anaesthesia. A midline skin incision with a medial parapatellar approach was used. Standard femoral and tibial bone cuts, soft-tissue balancing, component positioning, and cementation were performed according to the implant manufacturer's recommendations.
In Group A, the patella was resurfaced after appropriate resection of the patellar articular surface while maintaining adequate residual bone thickness. An appropriately sized patellar component was implanted, and patellar tracking was assessed intraoperatively.

In Group B, the native patellar articular surface was retained. Patellar osteophytes were removed where required, and patellar tracking was assessed after implantation of the femoral and tibial components. Any additional patellar procedure performed was documented.

Postoperative Management and Follow-up

Both groups received a standardized postoperative protocol, including analgesia, thromboprophylaxis, antibiotic prophylaxis, early mobilization, and physiotherapy. Knee ROM and weight-bearing were initiated according to the institutional rehabilitation protocol.
Patients were evaluated postoperatively at 6 weeks, 3 months, 6 months, and 12 months. At each follow-up, pain, anterior knee pain, knee ROM, functional status, and complications were documented. VAS and KSS were reassessed and compared with baseline values.

Outcome Measures
The primary outcome measures were postoperative pain, particularly anterior knee pain, and functional outcome assessed using the KSS.

The secondary outcome measures included knee ROM, improvement in VAS and KSS from baseline, patient satisfaction, and complications such as patellar fracture, maltracking, subluxation/dislocation, infection, component-related complications, stiffness, reoperation, and requirement for secondary patellar resurfacing.

Statistical Analysis
Data were entered into Microsoft Excel and analyzed using SPSS 21 statistical software. Continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR), according to data distribution, while categorical variables were presented as frequencies and percentages. Normality of continuous variables was assessed using the Shapiro–Wilk test.

For comparisons between the two groups, the independent-samples t-test was used for normally distributed continuous variables and the Mann–Whitney U test for non-normally distributed variables. Within-group changes from baseline were evaluated using the paired t-test or Wilcoxon signed-rank test, as appropriate. Categorical variables were compared using the Chi-square test or Fisher's exact test. Changes in repeatedly measured outcomes across follow-up visits were assessed using repeated-measures ANOVA or an appropriate non-parametric equivalent. A two-sided p-value <0.05 was considered statistically significant.

RESULTS
A total of 90 patients undergoing total knee arthroplasty were included in the study, with 45 patients each in the patellar resurfacing and non-resurfacing groups. The two groups were comparable with respect to baseline demographic and clinical characteristics. The mean age was 65.2 ± 6.8 years in the resurfacing group and 64.7 ± 7.1 years in the non-resurfacing group (p=0.734). There were no significant differences between the groups in sex distribution, BMI, operated side, preoperative VAS score, Knee Society Score (KSS), or range of motion (ROM), indicating comparable baseline characteristics (Table 1).Pain scores progressively decreased following surgery in both groups. At 6 weeks, the mean VAS score was lower in the resurfacing group than in the non-resurfacing group (4.1 ± 1.0 vs. 4.5 ± 1.1), although the difference was not statistically significant (p=0.074). A significantly lower VAS score was observed in the resurfacing group at 3 months (2.9 ± 0.9 vs. 3.4 ± 1.0; p=0.015), 6 months (2.1 ± 0.8 vs. 2.7 ± 0.9; p=0.001), and 12 months (1.5 ± 0.7 vs. 2.1 ± 0.9; p<0.001). The mean reduction in VAS from baseline to 12 months was also significantly greater in the resurfacing group (−6.1 ± 1.1) than in the non-resurfacing group (−5.4 ± 1.3; p=0.007) (Table 2).

KSS improved progressively during follow-up in both groups (Table 3; Figure 1). There were no significant between-group differences at 6 weeks (62.7 ± 7.2 vs. 61.4 ± 7.5; p=0.404) or 3 months (72.8 ± 6.8 vs. 70.5 ± 7.0; p=0.117). However, the resurfacing group demonstrated significantly higher KSS at 6 months (81.9 ± 6.1 vs. 78.8 ± 6.5; p=0.022) and 12 months (88.2 ± 5.5 vs. 84.7 ± 6.0; p=0.005). The improvement in KSS from baseline to 12 months was significantly greater following patellar resurfacing (44.4 ± 8.2 vs. 40.2 ± 8.8; p=0.021).

Knee ROM increased progressively in both groups throughout the follow-up period (Table 4). At 12 months, the mean ROM was 118.4 ± 7.0° in the resurfacing group compared with 115.6 ± 7.8° in the non-resurfacing group (p=0.076). The mean improvement from baseline was 26.0 ± 10.1° and 22.5 ± 10.5°, respectively (p=0.110). Although numerically greater improvement was observed with patellar resurfacing, none of the between-group differences in ROM reached statistical significance.

At 12 months, anterior knee pain was significantly less frequent in the patellar resurfacing group, occurring in 4/45 (8.9%) patients compared with 11/45 (24.4%) patients in the non-resurfacing group (p=0.048) (Table 5). Overall, 40 (88.9%) patients in the resurfacing group and 35 (77.8%) in the non-resurfacing group were satisfied or very satisfied with the procedure; however, the difference in patient satisfaction was not statistically significant (p=0.157).

Postoperative complications were infrequent in both groups (Table 6; Figure 2). Superficial infection occurred in 2.2% and 4.4%, knee stiffness in 4.4% and 6.7%, and patellar maltracking in 2.2% and 4.4% of patients in the resurfacing and non-resurfacing groups, respectively. One patellar fracture (2.2%) occurred in the resurfacing group. Two patients (4.4%) in the non-resurfacing group subsequently underwent secondary patellar resurfacing. Reoperation was required in one patient (2.2%) in the resurfacing group and two patients (4.4%) in the non-resurfacing group. None of the between-group differences in postoperative complications or reinterventions were statistically significant.

Correlation analysis demonstrated several significant associations with KSS at 12 months (Table 7; Figure 3). Age ($r/\rho=-0.28$; $p=0.008$), BMI ($r/\rho=-0.24$; $p=0.024$), preoperative VAS ($r/\rho=-0.31$; $p=0.003$), and 12-month VAS ($r/\rho=-0.58$; $p<0.001$) showed significant negative correlations with 12-month KSS. In contrast, preoperative KSS ($r/\rho=0.42$; $p<0.001$), preoperative ROM ($r/\rho=0.35$; $p=0.001$), and 12-month ROM ($r/\rho=0.49$; $p<0.001$) showed significant positive correlations with 12-month KSS. Among the evaluated variables, 12-month VAS demonstrated the strongest negative correlation, whereas 12-month ROM demonstrated a moderately strong positive correlation with functional outcome.

Overall, both groups demonstrated substantial improvement in pain, functional scores, and knee ROM following total knee arthroplasty. Patellar resurfacing was associated with significantly lower pain scores from 3 months onward, higher KSS at 6 and 12 months, greater overall improvement in KSS, and a lower incidence of anterior knee pain at 12 months. In contrast, differences in postoperative ROM, patient satisfaction, and complication or reintervention rates did not reach statistical significance.

Table 1. Baseline demographic and clinical characteristics

Parameter	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Age (years), mean ± SD	65.2 ± 6.8	64.7 ± 7.1	0.734	Independent t-test
Male, n (%)	17 (37.8%)	18 (40.0%)	0.829	Chi-square test
Female, n (%)	28 (62.2%)	27 (60.0%)		
BMI (kg/m²), mean ± SD	27.4 ± 3.2	27.1 ± 3.5	0.672	Independent t-test
Right knee, n (%)	24 (53.3%)	23 (51.1%)	0.833	Chi-square test
Left knee, n (%)	21 (46.7%)	22 (48.9%)		
Preoperative VAS, mean ± SD	7.6 ± 1.0	7.5 ± 1.1	0.653	Independent t-test
Preoperative KSS, mean ± SD	43.8 ± 7.6	44.5 ± 7.3	0.657	
Preoperative ROM (°), mean ± SD	92.4 ± 11.2	93.1 ± 10.8	0.763	

Table 2. Comparison of VAS pain scores during follow-up

Time point	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Preoperative	7.6 ± 1.0	7.5 ± 1.1	0.653	Independent t-test
6 weeks	4.1 ± 1.0	4.5 ± 1.1	0.074	
3 months	2.9 ± 0.9	3.4 ± 1.0	0.015	
6 months	2.1 ± 0.8	2.7 ± 0.9	0.001	
12 months	1.5 ± 0.7	2.1 ± 0.9	<0.001	
Change: baseline to 12 months	−6.1 ± 1.1	−5.4 ± 1.3	0.007	

Table 3. Comparison of Knee Society Score (KSS)

Time point	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Preoperative	43.8 ± 7.6	44.5 ± 7.3	0.657	Independent t-test
6 weeks	62.7 ± 7.2	61.4 ± 7.5	0.404	
3 months	72.8 ± 6.8	70.5 ± 7.0	0.117	
6 months	81.9 ± 6.1	78.8 ± 6.5	0.022	
12 months	88.2 ± 5.5	84.7 ± 6.0	0.005	
Improvement from baseline	44.4 ± 8.2	40.2 ± 8.8	0.021	

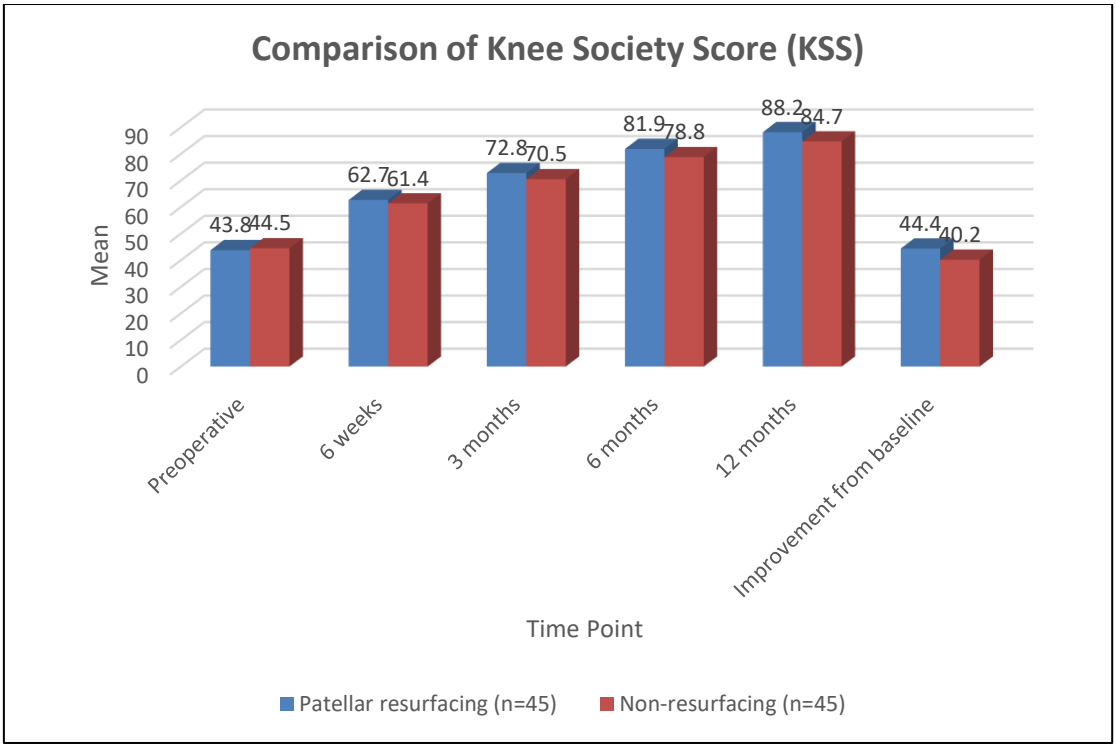

Figure 1. Comparison of Knee Society Score (KSS)

Table 4. Comparison of knee range of motion

Time point	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Preoperative	92.4 ± 11.2°	93.1 ± 10.8°	0.763	Independent t-test
6 weeks	101.8 ± 9.5°	100.6 ± 9.8°	0.556	
3 months	109.5 ± 8.3°	107.8 ± 8.7°	0.346	
6 months	115.2 ± 7.5°	112.9 ± 8.0°	0.162	
12 months	118.4 ± 7.0°	115.6 ± 7.8°	0.076	
Improvement from baseline	26.0 ± 10.1°	22.5 ± 10.5°	0.110	

Table 5. Anterior knee pain and patient satisfaction at 12 months

Outcome	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Anterior knee pain present	4 (8.9%)	11 (24.4%)	0.048	Chi-square test
Anterior knee pain absent	41 (91.1%)	34 (75.6%)		
Very satisfied	25 (55.6%)	20 (44.4%)	0.157	
Satisfied	15 (33.3%)	15 (33.3%)		
Unsatisfied	5 (11.1%)	10 (22.2%)		
Overall satisfied/very satisfied	40 (88.9%)	35 (77.8%)	0.157	

Table 6. Comparison of postoperative complications and reinterventions

Complication	Patellar resurfacing (n=45)	Non-resurfacing (n=45)	p-value	Statistical test
Superficial infection	1 (2.2%)	2 (4.4%)	1.000	Fisher's exact test
Knee stiffness	2 (4.4%)	3 (6.7%)	1.000	
Patellar maltracking	1 (2.2%)	2 (4.4%)	1.000	
Patellar fracture	1 (2.2%)	0 (0.0%)	1.000	
Secondary patellar resurfacing	0 (0.0%)	2 (4.4%)	0.494	
Reoperation	1 (2.2%)	2 (4.4%)	1.000	

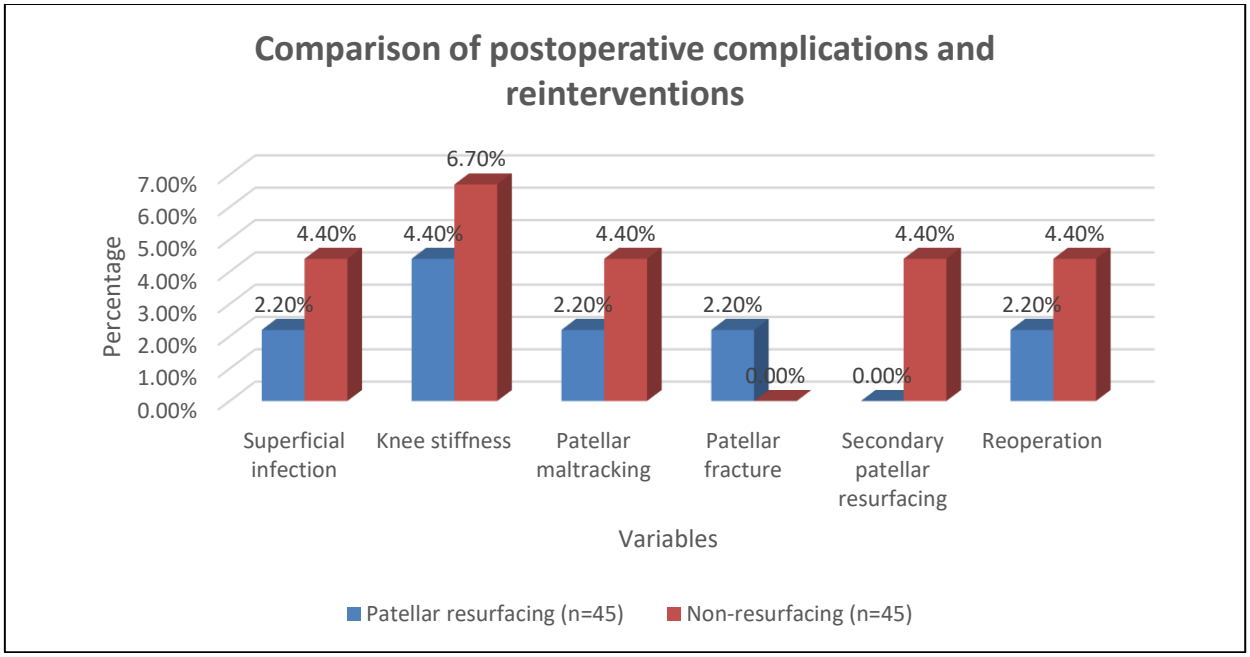

Figure 2. Comparison of postoperative complications and reinterventions

Table 7. Correlation of clinical variables with KSS at 12 months

Variable	Correlation coefficient (r/ρ)	p-value
Age	−0.28	0.008
BMI	−0.24	0.024
Preoperative VAS	−0.31	0.003
Preoperative KSS	0.42	<0.001
Preoperative ROM	0.35	0.001
12-month VAS	−0.58	<0.001
12-month ROM	0.49	<0.001

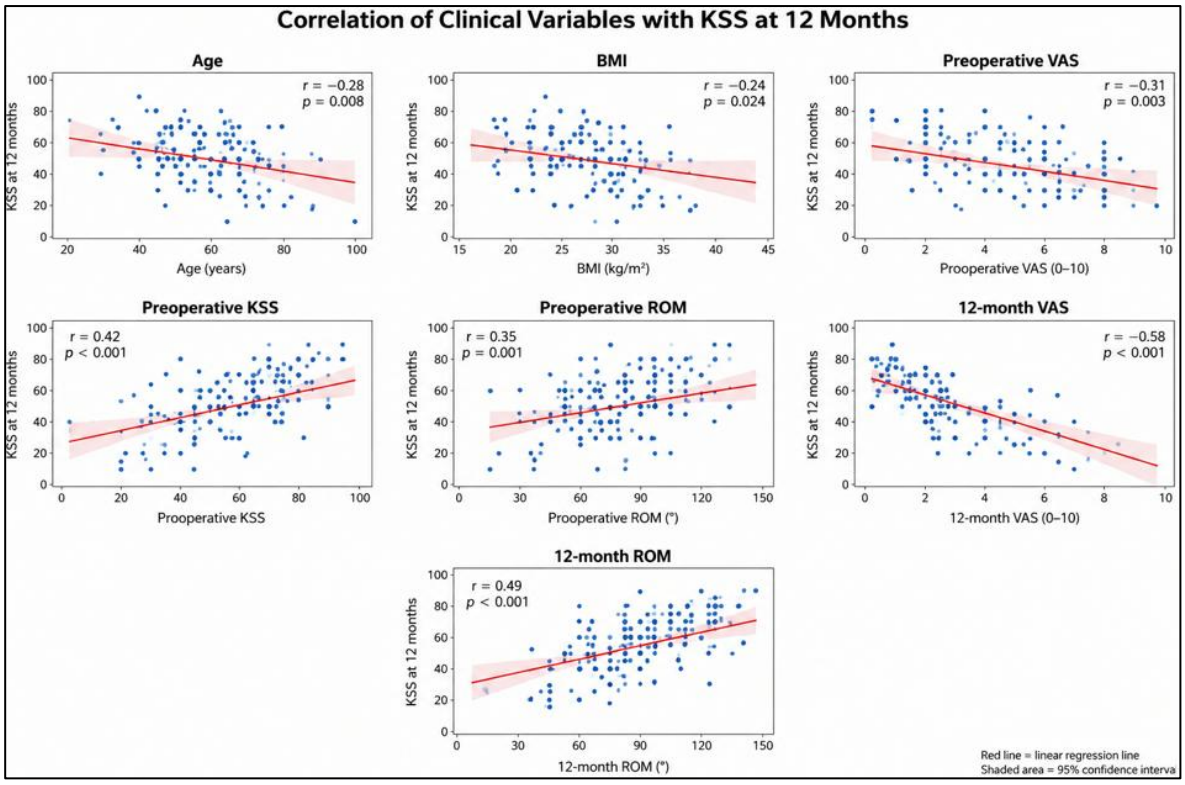

Figure 3. Correlation of clinical variables with KSS at 12 months

DISCUSSION

The two study groups were comparable at baseline. Mean age was 65.2 ± 6.8 years in the resurfacing group and 64.7 ± 7.1 years in the non-resurfacing group (p=0.734), while preoperative VAS (7.6 ± 1.0 vs 7.5 ± 1.1), KSS (43.8 ± 7.6 vs 44.5 ± 7.3), and ROM (92.4 ± 11.2° vs 93.1 ± 10.8°) were also comparable. Abraham et al. [16] similarly evaluated 100 knees (47 resurfaced and 53 non-resurfaced) with comparable baseline characteristics, supporting meaningful comparison between treatment groups.

Pain improved significantly in both groups, but resurfacing showed better late outcomes. At 12 months, VAS was 1.5 ± 0.7 versus 2.1 ± 0.9 (p<0.001), while anterior knee pain occurred in 8.9% versus 24.4% (p=0.048) in the resurfacing and non-resurfacing groups, respectively. Levai et al. [17], in 71 knees, similarly reported that patellar resurfacing substantially reduced peripatellar pain. In contrast, Abraham et al. [16] found only a marginal improvement in rest pain with resurfacing (p=0.04), while walking pain was comparable between groups.

KSS improved from 43.8 ± 7.6 to 88.2 ± 5.5 in the resurfacing group and from 44.5 ± 7.3 to 84.7 ± 6.0 in the non-resurfacing group, with significantly better 12-month KSS after resurfacing (p=0.005). Abraham et al. [16], however, reported comparable walking distance, stair climbing, chair-rise ability, extensor lag, and quadriceps strength between resurfaced and non-resurfaced knees. Insall et al. (1985) [18] supported patellar resurfacing in most arthritic knees while emphasizing that alignment and ligament balancing are also major determinants of functional outcome.

At 12 months, ROM improved to 118.4 ± 7.0° in the resurfacing group and 115.6 ± 7.8° in the non-resurfacing group; the difference was not statistically significant (p=0.076). Similarly, Abraham et al. [16] found no significant difference in active arc of motion between resurfaced and non-resurfaced knees. Thus, resurfacing may influence pain more than the ultimate mechanical range of knee movement.

At 12 months, 88.9% of resurfaced patients and 77.8% of non-resurfaced patients were satisfied or very satisfied, although the difference was not significant (p=0.157). The comparable functional parameters reported by Abraham et al. [16] also suggest that overall patient outcome is influenced by multiple factors rather than patellar resurfacing alone.

Complication rates were low and comparable. Patellar fracture occurred in 2.2% of resurfaced patients, while secondary resurfacing was required in 4.4% of initially non-resurfaced patients. Levai et al. [17] reported two patellar fractures among rheumatoid, osteoporotic patellae in their original series, highlighting a potential resurfacing-related complication. Scott et al. (1978) [19], in their clinical and biomechanical evaluation of patellar replacement, emphasized the importance of patellofemoral biomechanics in determining the outcome of patellar replacement. Detailed numerical clinical outcomes from their brief Orthopaedic Transactions report are not readily available and therefore cannot be directly compared quantitatively.

CONCLUSION

Both patellar resurfacing and non-resurfacing resulted in substantial clinical and functional improvement following primary TKA. Patellar resurfacing was associated with significantly lower 12-month VAS (1.5 ± 0.7 vs 2.1 ± 0.9), higher KSS (88.2 ± 5.5 vs 84.7 ± 6.0), and less anterior knee pain (8.9% vs 24.4%). However, ROM, patient satisfaction, and complication rates were comparable between the groups.

LIMITATIONS

The study was limited by its relatively small sample size (n=90), single-center design, and follow-up of only 12 months. Longer follow-up with a larger multicentric cohort is required to assess long-term functional outcomes, implant-related complications, and revision rates.

REFERENCES

1. Harris WH, Sledge CB. Total hip and total knee replacement. N Engl J Med. 1990;323:725–31.
2. Quinet RJ, Winters EG. Total joint replacement of the hip and knee. Med Clin North Am. 1992;76:1235–51.
3. Boyd AD, Ewald FC, Thomas WH, Poss R, Sledge CB. Long-term complications after total knee arthroplasty with or without resurfacing of the patella. J Bone Joint Surg Am. 1993;75:674–81.
4. Teel AJ, Esposito JG, Lanting BA, Howard JL, Schemitsch EH. Patellar resurfacing in primary total knee arthroplasty: a meta-analysis of randomized controlled trials. J Arthroplasty. 2019;34:3124–32.
5. Vince KG, McPherson EJ. The patella in total knee arthroplasty. Orthop Clin North Am. 1992;23:675–86.
6. Ranawat CS. The patellofemoral joint in total condylar knee arthroplasty. Pros and cons based on five- to ten-year follow-up observations. Clin Orthop Relat Res. 1986;(205):93–9.
7. Picetti GD, McGann WA, Welch RB. The patellofemoral joint after total knee arthroplasty without patellar resurfacing. J Bone Joint Surg Am. 1990;72:1379–82.

9. Soudry M, Mestriner LA, Binazzi R, Insall JN. Total knee arthroplasty without patellar resurfacing. Clin Orthop Relat Res. 1986;(205):166–70.
10. Longo UG, Ciuffreda M, Mannering N, D'Andrea V, Cimmino M, Denaro V. Patellar resurfacing in total knee arthroplasty: systematic review and meta-analysis. J Arthroplasty. 2018;33:620–32.
11. Migliorini F, Eschweiler J, Niewiera M, El Mansy Y, Tingart M, Maffulli N. Better outcomes with patellar resurfacing during primary total knee arthroplasty: a meta-analysis study. Arch Orthop Trauma Surg. 2019;139:1445–54.
12. Grela M, Barrett M, Kunutsor SK, Blom AW, Whitehouse MR, Matharu GS. Clinical effectiveness of patellar resurfacing, no resurfacing and selective resurfacing in primary total knee replacement: systematic review and meta-analysis of interventional and observational evidence. BMC Musculoskelet Disord. 2022;23.
13. Chen K, Dai X, Li L, Chen Z, Cui H, Lv S, et al. Patellar resurfacing versus nonresurfacing in total knee arthroplasty: an updated meta-analysis of randomized controlled trials. J Orthop Surg Res. 2021;16:83.
14. Tang X, He Y, Pu S, Lei L, Ning N, Shi Y, et al. Patellar resurfacing in primary total knee arthroplasty: a meta-analysis and trial sequential analysis of 50 randomized controlled trials. Orthop Surg. 2023;15:379–99.
15. Liu L, Li J, Wang Y, Li X, Han P, Li X. Different modalities of patellar management in primary total knee arthroplasty: a Bayesian network meta-analysis of randomized controlled trials. J Orthop Surg Res. 2024;19:74.
16. Usman MA, Yurianto H, Rahmansyah N, Anwar SFZ. Functional outcome and cost effectiveness of patellar resurfacing and non-resurfacing in total knee arthroplasty: systematic review and meta-analysis. J Orthop Surg Res. 2025;20:492.
17. Abraham W, Buchanan JR, Daubert H, Greer RB, Keefer J. Should the patella be resurfaced in total knee arthroplasty? Efficacy of patellar resurfacing. Clin Orthop Relat Res. 1988;(236):128–34.
18. Levai JP, McLeod HC, Freeman MA. Why not resurface the patella? J Bone Joint Surg Br. 1983;65(4):448–51.
19. Insall JN, Binazzi R, Soudry M, Mestriner CA. Total knee arthroplasty. Clin Orthop Relat Res. 1985;(192):13–22.
20. Scott WN, Rozbruch JD, Otis JC, Insall J, Ranawat CS, Burstein AH. Clinical and biomechanical evaluation of patella replacement in total knee arthroplasty. Orthop Trans. 1978;2:203–7.