

Evaluation of clinical outcome of non-patella resurfacing total knee replacement

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Introduction: There is no difference in clinical and functional outcome after total knee arthroplasty (TKA) for knee osteoarthritis between patellar resurfacing and non-resurfacing. Thus, the current study has performed this study to evaluate the outcome of non-patella resurfacing total knee arthroplasty. **Methods:** A total of 50 patients in series who came to our institute with clinical signs and symptoms of osteoarthritis confirmed radiologically, were operated. The current study measured the outcomes with Knee society score and VAS score. **Results:** There was a significant difference in the outcome of non-resurfaced patella pre-operatively and post-operatively. There was a significant improvement in the mean range of motion (ROM) 87.2 pre-op vs 104.4 post-ops, KSS pre-op mean 39.66 vs post-op mean 83.26. The improvement in the functional score was pre-op 52.5 to post-op 83.36. The mean VAS score decreased from 7.98 to 2. There was no difference in patella resurfacing and non-patella resurfacing. **Conclusion:** The results showed a significant difference in knee society score and VAS pre-operatively and post-operatively.

Keywords: Non-patellar resurfacing, Osteoarthritis, Total knee arthroplasty

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Introduction

Total knee arthroplasty is a reliable procedure used to correct knee deformities, relieve pain and improve knee function following arthritis. Anterior knee pain is a major postoperative complication that compromises patient satisfaction. Patellar resurfacing have offered

Varying results. On one side there is the hesitancy to resurface the patella routinely in total knee arthroplasty as there is the history of higher than acceptable complications with the patellar component, on another side, there is the problem with anterior knee pain post-non-resurfacing of the patella in total knee replacement.

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The results comparing knee pain in resurfaced and non-resurfaced patella are mixed. There are authors recommending routine resurfacing [1-4] routine retention [5,6] and selective resurfacing of the patella [7-11]. This study is required because, in some of the surgeries, the patella is replaced whereas, in some of the surgeries, the patella is not replaced. Thus, the current study intends to study the results between resurfacing of patella versus not resurfacing of the patella and its impact on the patients after the operation.

Methodology

All 50 patients in the series were referred to as orthopaedic OPD of C.U.SHAH Hospital, Surendranagar with clinical symptoms and signs of osteoarthritis confirmed radiologically by Kellegren Lawrence [12] classification for tricompartmental osteoarthritis and were treated as indoor patients. Patients with no ipsilateral knee or ankle arthritis or a fracture or spine deformity were advised for operation Patients were sent for medical and anaesthetic fitness Fit patients giving consent taken for the operation.

Inclusion criteria

01. All patients undergoing total knee replacement in C.U. Shah Medical College and Hospital.
02. Age 50 and above
03. Neuro-vascular status normal

Exclusion criteria

01. All patients who are medically unfit
02. All patients satisfying inclusion criteria
03. Ipsilateral hip and knee arthritis
04. Total knee replacement is done in pathological fracture/ stress fracture/ healed fracture in the proximal tibia or distal femur.
05. Spine deformity or disc pathology

Operated patients are evaluated by Knee society score [13] and Visual Analogue Score [14-15]. Patients are followed up for a minimum 1 year and evaluated with follow up x-rays. The current study was a prospective observational study. Standard surgical techniques including midline incision and medial Para-patellar exposure was utilized. Standard femoral and tibial cuts were taken PCL was cut. Soft tissue balancing was done. External rotation of femoral component was kept at 3 degrees from posterior condylar axis according to

Manufacturer instrumentation. The current study used cemented Johnson and Johnson Depuy posterior cruciate substituting total knee replacement prosthesis. In all patients, patellar osteophytes were removed, the rim was cauterized in 5mm edge of patella, fibrillated cartilage smoothed and denervated. The anatomical patella tracking was ensured.Tourniquet was used during the procedure. A standard protocol was followed ensuring all subjects received similar preoperative, perioperative and post-operative care (Figure 1-5). Early mobilization was encouraged starting first post-operative day.The present study has used paired t-test using the Graph-pad software for analysis.

Results

The mean pre-op knee society clinical scoring was 39.66. The mean post-op knee society clinical scoring was 83.26. The p-value was less than 0.0001 which is extremely statistically significant. This indicated the favourable outcome of our post-operative patients in terms of flexion,extension, valgus-varus orientation, post-operative instability etc (Table 1).

Clinical Outcome- The knee society clinical score in the present study is 83.26 which is excellent.

Table-1: Pre-operative and postoperative clinical outcome with their resurfaced group.

Column1	Pre-op	Post-op
Resurfacing	39.7	92
Non- resurfacing	40.08	83.26

Functional score: The functional score is independent of clinical score and evaluates the walking distance, act of climbing and descending stairs, and use of aids while walking.The mean pre-op functional score was 52.5. The mean post-op functional score was 83.36. The p-value of the patient is less than 0.0001 which is extremely statistically significant (Table 2).

Table-2: On comparing knee society score with their resurfaced patella.

Column1	Pre-op	Post-op
Resurfacing	57.4	87
Non resurfacing	40.08	83.26

The mean postoperative clinical knee society score in their resurfaced patella and our non-resurfaced patella is 87 and 83.26 respectively, which is excellent according to clinical scoring and comparable (Table 3).

Table-3: On comparing knee society score with their resurfaced patella.

Column1	Pre-op	Post-op
Resurfacing	26.97	84.75
Non-resurfacing	40.08	83.26

Table-4: Functional outcome comparison in pre-op and post-op groups.

Column1	Pre-op	Post-op
Resurfacing	51.9	60
Non resurfacing	52.5	84.06

The outcome of the functional score is also considered good in our post-operative patients considering the criteria such as walking without aid, climbing, descending of stairs etc.

VAS Score: Visual analogue score is another method used to evaluate the outcome based on the intensity of pain. In the present study, pre-operative VAS scoring is 7.98 and post-operative was 2 (Table 5).

Table-5: Comparison of pre-operative and post-operative VAS scoring in a previously conducted study.

Column1	Pre-op	Post-op
Resurfacing	8.67	1.5
Non resurfacing	7.98	2

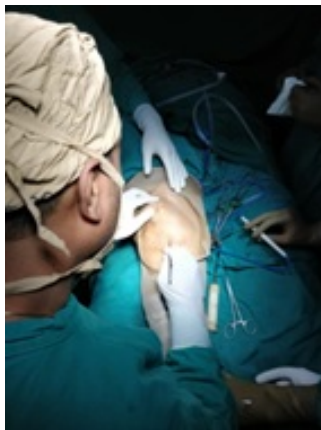


Fig-1: Incision for TKR.



Fig-2: Distal femoral cut.



Fig-3: Placement of femoral and tibial prosthesis.





Fig-4: Post-operative knee range of motion.



Fig-5: Pre-operative and post-operative X-ray.

Discussion

Osteoarthritis (OA) is a chronic degenerative joint disease and a major cause of disability in elderly people[16]. In most arthritic knees, some degree of instability, deformity, contracture or combination of these elements, can be found [17-19].

The surgical techniques have varied from soft tissue interposition arthroplasty to resection arthroplasty to surface replacement arthroplasty.

This prospective study was done to evaluate the outcome non-patella resurfacing arthroplasty using clinical and functional knee society score and VAS score and to find the difference between non-patella and patella resurfacing TKA.

There are three proponents for patella resurfacing-those who routinely resurface the patella, those who never resurface patella and those who selectively resurface patella. There have been reports of anterior knee pain is a common complication, with residual anterior knee pain present between 5% to 45%[20-23] in patients who do not resurface patella. Routine patellar resurfacing appears to be an option to reduce patellofemoral-related pain, but prospective randomised trials have not provided

Consistent results in the short- to medium-term [24-26].

Residual anterior knee pain after TKR is a common cause of early revision surgery, but resurfacing the patella in these circumstances may not relieve the symptoms[27-28].

Routine resurfacing of the patella has also complications. These included patellar fracture, extensor mechanism disruption, osteonecrosis, aseptic loosening, instability and dislocation, overstuffing of the patellofemoral joint, polyethylene wear, and patellar clunk syndrome[29].

The present study compared our scoring with that of the resurfaced patella.

A.J. Smith, D.J. Wood, M.G. Li et al[30] did a randomized study on 181 patients. Clinical follow up was available in 159 knees. On comparing the pre-op and post-op clinical outcome with their resurfaced group, the excellent outcome was achieved. David J. wood, Anne J Smith et al[31] performed a randomized study on patellar resurfacing in 220 osteoarthritic knees. There was no significant difference in knee society clinical score between the present study and result of Mohammad H. Kaseb, Mohammad N. Tahmasebi et al[32]. Functional outcome in A.J. Smith, D.J. Wood, M.G. Li et al [30] was lower compared to the present study (Table 6).

Table-6: The functional outcome comparison between the present study of non-resurfaced patella and study of the resurfaced patella in previously conducted study.

Column1	Pre-op	Post-op
Resurfacing	51.6	70
non-resurfacing	52.5	84.06

From the above the result it is evident that non-resurfaced patella has better functional score than the resurfaced patella.

Table-7: Comparison of the functional outcome in pre-op and post-op groups between the present study of non-resurfaced patella and study of the resurfaced patella in previously conducted study.

Column1	Pre-op	Post-op
Resurfaced	28.87	83.75
Non-resurfaced	52.5	84.06

The present study compared the functional outcome of the present study with Mohammad H. Kaseb, Mohammad N. Tahmasebi et al [32] and the

Functional outcome is similar in both these studies and comparable (Table 7).

The mean VAS score in the study of Mohammad H. Kaseb, Mohammad N. Tahmasebi et al[32] pre-operative and post-operative is 8.67 and 1.5. In the present study, pre-operative VAS scoring is 7.98 and post-operative is 2. Dr. Manjunath KS, Dr.Goplakrishna et al[33] compared VAS scoring pre-operatively and post-operatively (Table 8).

Table-8: Comparison of pre-operative and post-operative VAS scoring.

Column1	Pre-op	Post-up
Non resurfaced	7.9	2
Resurfaced	7.7	1.9

The anterior knee pain score in Dr. Manjunath KS, Dr.Goplakrishna et al[33] study is 1.4 (Mean) compared to the present study which is 2 (Table 9).

Table-9: Comparison of anterior knee pain score.

Column1	Post-op and knee pain
Resurfaced	1.4
Non-resurfaced	2

The anterior knee pain in a study conducted by A.J. Smith, D.J. Wood et al[30], in the resurfacing group 18 out of 86 (20.9%) patient had anterior knee pain whereas 4 out of 50 (8%) patient had anterior knee pain in non-resurfacing

The major limitations of the present study were the size of the sample. More the size of the population better comparison in terms of outcome. Also considering the current study did not resurface patella and comparing with other studies was one more limitation. The present study has not resurfaced the patella in our patients and has evaluated the outcome using knee society score and VAS score. The present study has compared our data with those of resurfaced patella using the same parameter.

Conclusion

The result of the present study indicated no superiority of non-patellar resurfacing compared to patellar resurfacing in terms of clinical outcome. The knee society clinical outcome of non-patellar resurfacing is not statistically significant in comparison to the resurfacing of the patella. The functional outcome of non-patellar resurfacing is good and comparable to other studies. The number of patients having anterior knee pain is quite low.

The reason for having less anterior pain may relate to denervating the patellar rim by cauterization and removing the osteophytes and decompressing it.

What does the study add to the existing knowledge?

The results of the present study establish that not resurfacing the patella gives an equally good result, however the current study recommend selective resurfacing of the patella as indicated such as rheumatoid arthritis, age more than 60 years, intraoperative maltracking of patella.

Author's contribution

Dr. Shreyas Gandhi: Concept, chief surgeon

Dr. Darshil Parikh: Study design

Dr. Tapan Ankleshwaria: Manuscript writing

Dr. Pathik Vala: Data collection

Reference

01. Rae PJ, Noble J, Hodgkinson JP. Patellar resurfacing in total condylar knee arthroplasty-technique and results. *J Arthroplasty*. 1990;5(3)259-265.
doi: [Article] [Crossref]
02. Webster DA, Murray DG. Complications of Variable Axis total knee arthroplasty. *Clin Orthop Relat Res*. 1985(193)160-167.
[Crossref]
03. Levai JP, McLeod HC, Freeman MA. Why not resurface the patella?. *J Bone Joint Surg*. 1983;65(4)448-451.
[Crossref]
04. Ranawat CS. The patellofemoral joint in total condylar knee arthroplasty, Pros and cons based on five-to ten-year follow-up observations. *Clin Orthopaed Relat Res*. 1986;(205)93-99.
[Crossref]
05. Abraham W, Buchanan JR, Daubert H, Keefer J. Should the patella be resurfaced in total knee arthroplasty?- Efficacy of patellar resurfacing. *Clin Orthopaed Relat Res*. 1988;(236)128-134.
[Crossref]
06. Brick GW, Scott RD. The patellofemoral component of total knee arthroplasty. *Clin Orthopaed Relat Res*. 1988;(231)163-178.
[Crossref]
07. Keblish PA, Varma AK, Greenwald AS. Patellar resurfacing or retention in total knee arthroplasty, A prospective study of patients with bilateral replacements. *J Bone Joint Surg*. 1994;76(6)930-937.
[Crossref]
08. Levitsky KA, Harris WJ, McManus JA, Scott RD. Total knee arthroplasty without patellar resurfacing, Clinical outcomes and long-term follow-up evaluation. *Clin Orthopaed Relat Res*. 1993;(286)116-121.
[Crossref]
09. Picetti IV GB, McGann WA, Welch RB. The patellofemoral joint after total knee arthroplasty without patellar resurfacing. *J Bone Joint Surg (Am)*. 1990;72(9)1379-1382.
[Crossref]
10. Scott RD, Reilly DT. Pros and cons of patellar resurfacing in total knee replacement. *Orthop Trans*. 1980;4;328.
[Crossref]
11. Soudry M, Mestriner LA, Binazzi R, Insall JN. Total knee arthroplasty without patellar resurfacing. *Clin Orthopaed Relat Res*. 1986;(205)166-170.
[Crossref]
12. Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. *Annals of the rheumatic diseases*. 1957;16(4)494-502.
doi: [Article] [Crossref]
13. Insall JN, Dorr LD, Scott RD, Scott WN. Rationale of the Knee Society clinical rating system. *Clin Orthop Relat Res*. 1989;248(248)13-14.
[Crossref]
14. Huskisson EC. Measurement of pain. *The Lancet*. 1974;304 (7889)1127-1131.
doi: [Article] [Crossref]
15. Scott J, Huskisson EC. Graphic representation of pain. *Pain*. 1976;2(2)175-184.
[Crossref]
16. Ethgen O, Bruyere O, Richy F, Dardennes C, Reginster JY. Health-related quality of life in total hip and total knee arthroplasty, A qualitative and systematic review of the literature. *J Bone Joint Surg Am*. 2004;86(5)963-974.
doi: [Article] [Crossref]

17. Vail TP, Lang JE. Insall and Scott surgery of the knee. 4th ed, Philadelphia- Churchill Livingstone, Elsevier. 2006;1455-1521.
[Crossref]
18. Insall J, Ranawat CS, Scott WN, Walker P. Total condylar knee replacement, Preliminary report. Clin Orthop Relat Res. 1976;(120)149-154.
[Crossref]
19. Kim RH, Scott WN. Operative techniques- total knee replacement. Philadelphia- Saunders- Elsevier. 2009: 91-103.
[Crossref]
20. Ranawat CS. The patellofemoral joint in total condylar knee arthroplasty, Pros and cons based on five-to ten-year follow-up observations. Clin Orthopaed Relat Res. 1986;(205)93-99.
[Crossref]
21. Insall J, Scott WN, Ranawat CS. The total condylar knee prosthesis- A report of two hundred and twenty cases. J Bone Joint Surg. 1979;61(2)173-180.
[Crossref]
22. Freeman MA, Samuelson KM, Elias SG, Mariorenzi LJ, Gokcay EI, Tuke M. The patellofemoral joint in total knee prostheses- Design considerations. J Arthroplasty. 1989;4;S69-74.
doi: [Article] [Crossref]
23. Board TN, Javed A. Patellar resurfacing in total knee arthroplasty. J Bone Joint Surg. 2003;85(12)2483-2484.
doi: [Article] [Crossref]
24. Feller JA, Bartlett RJ, Lang DM. Patellar resurfacing versus retention in total knee arthroplasty. J Bone Joint Surg. 1996;78(2)226-228.
[Crossref]
25. Barrack RL, Wolfe MW, Waldman DA, Milicic M, Bertot AJ, Myers L. Resurfacing of the patella in total knee arthroplasty, A prospective, randomized, double-blind study. J Bone Joint Surg. 1997;79(8):1121-1131.
doi: [Article] [Crossref]
26. Waters TS, Bentley G. Patellar resurfacing in total knee arthroplasty- a prospective, randomized study. J Bone Joint Surg Am. 2003;85(2)212-217.
doi: [Article] [Crossref]
27. Muoneke HE, Khan AM, Giannikas KA, Hägglund E, Dunningham TH. Secondary resurfacing of the patella for persistent anterior knee pain after primary knee arthroplasty. J Bone Joint Surg. 2003;85(5)675-678.
[Crossref]
28. Campbell DG, Mintz AD, Stevenson TM. Early patellofemoral revision following total knee arthroplasty. J Arthroplasty. 1995;10(3)287-291.
doi: [Article] [Crossref]
29. Abdel MP, Parratte S, Budhiparama NC. The patella in total knee arthroplasty to resurface or not is the question. Curr Rev Musculoskelet Med. 2014;7(2)117-124.
doi: [Article] [Crossref]
30. Smith AJ, Wood DJ, Li MG. Total knee replacement with and without patellar resurfacing- a prospective, randomised trial using the profix total knee system. J Bone Joint Surg. 2008;90(1)43-49.
doi: [Article] [Crossref]
31. Wood DJ, Smith AJ, Collopy D, White B, Brankov B, Bulsara MK. Patellar resurfacing in total knee arthroplasty- a prospective, randomized trial. J Bone Joint Surg Am. 2002;84(2)187-193.
doi: [Article] [Crossref]
32. Kaseb MH, Tahmasebi MN, Mortazavi SJ, Sobhan MR, Nabian MH. Comparison of clinical results between patellar resurfacing and non-resurfacing in total knee arthroplasty- a short term evaluation. Arch Bone J t Surg. 2018;6(2):124-129.
[Crossref]
33. Manjunath KS, Gopalakrishna KG, Mahmood K, Hemanth HP. To resurface the patella or not, in primary total knee arthroplasty?- A prospective study. Int J Orthopaed. 2017;3(1)225-229.
doi: [Article] [Crossref]