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Original Article

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A Comparative Study of Patellar Resurfacing Versus It's Retention in Total Knee Arthroplasty

Dr. Hrishikesh Desai[1*]; Dr. Nirav solanki[1]

[1]Asst. professor and unit head; Department of orthopaedics, NAMO Medical college and researchcentre, Silvassa, DNH, India.

ABSTRACT

Background: Total knee arthroplasty is one of the most successful operations in modern orthopedics with less than 5% complications. Unfortunately, half of them are patella complications which naturally make patellar resurfacing a topic of debate since the advent of this surgery. In this randomized prospective left right study, we try to evaluate the best means of overcoming this problem.

Materials and Methods: 60 knees were operated which were in a period of 3 years and followed up for a mean of 21 months. Randomisation was achieved by resurfacing all right knees while retaining all left knees. We had equal number of left and right knees and the results were evaluated with the help of Knee Society score, Patellar score, anterior knee pain and complication rate.

Results: The incidence of anterior pain in knees without patellar resurfacing (24%) was significantly higher than that in knees with patellar resurfacing (12%). This pain was not related to pre op pain and was not related to age, sex, obesity, or grade of chondromalacia of the patella. There were no patella-femoral complications in the resurfaced groups as such.

Conclusion: If equal time and importance is given to the third component of the total knee arthroplasty it helps in preventing the so often encountered patella-femoral complications. This leads to over all better functional results especially lesser incidence of post op anterior knee pain. More importantly selective knee resurfacing is no better as other indicators of resurfacing were proved to be not of much use in this study.

Key Words: *Knee Arthroplasty, patellar resurfacing, chondromalacia*

***Corresponding Author**
Dr. Hrishikesh Desai
Asst. professor and unit head; Department of orthopaedics, NAMO Medical college and researchcentre, Silvassa, DNH, India.

INTRODUCTION

Technology and instrumentation have improved tibial and femoral resurfacing, but few such advances have occurred with patella resurfacing as treatment of the patella at the time of total knee arthroplasty remains controversial.

Numerous clinical trials have been done to help clarify the indications for patellar resurfacing. Despite the numerous trials, there are three basic strategies: always resurface, never resurface, or selectively resurface the patella. Unfortunately, there is little consensus, and surgeon preference remains the primary variable.(M, et al., 2022)[1].

Prospective randomized controlled trials constitute the most reliable source of evidence for the evaluation of the efficacy of a potential intervention leading to a favourable outcome and not the prejudiced choice of the surgeon. This is the basis of this study.

MATERIALS AND METHODS

The study was conducted on the patients at the department of orthopaedic surgery of NAMO Medical college, from January 2019 to February 2021.

Patient selection criteria: Tricompartmental primary osteoarthritis knee of more than 2 years duration.
Exclusion criteria were:
-a previous tibial osteotomy / unicompartmental arthroplasty
-a history of septic arthritis or osteomyelitis
-severe medical disability limiting the ability to walk
-disabling joint disease in another lower extremity joint
-inflammatory arthropathy

-a history of patellar fracture , a prior patellectomy, patellofemoral instability or an operation involving the extensor mechanism of knee joint.

40 patients who met the inclusion criteria were offered enrolment in the study, and all 40 patients (63 knees) agreed to participate.

Of these 63 knees, three had failure of the total knee replacement due to late deep infection; this left a total of 60 knees available for follow up. Same posterior-cruciate-sparing prosthetic components used and all operations were performed by or under the direct supervision of the same surgeon.

Randomization was accomplished by compulsory resurfacing of all right knee patellae while retaining all left knees patellae.

Cemented, three-peg, all-polyethylene component was utilized.
When resurfacing was not performed, patelloplasty was carried out.

Study evaluations were conducted preoperatively and at follow-up visits conducted at 2 weeks, six months, at twelve months, and annually thereafter. At all preoperative and postoperative visits, knee society clinical score, patella score and anterior knee pain score were recorded.

RESULTS

- Anterior knee pain;
  12 patients had developed anterior knee pain
- Intraoperative complications;
  2 patients had partial anterior MCL fibers tear, repaird.
- Post operative complicatios:
  1 patient had superficial vicryl infections treated well with antibiotics.
  2 patients had around 10 degree FFD corrected with physiotherapy.

Patients who had a bilateral procedure

- 25 patients who had gone for bilateral knee were asked to compare the knees, 10 (40 percent) said that they preferred the resurfaced side, 9 (36 percent) said that they preferred the non-resurfaced side, and 6 (24 percent) had no preference.
- No significant difference in radiographic position of patella or patellar prosthesis.
- But subluxation in the 2 cases of non resurfaced patella which was clinically apparent.

DISCUSSION AND CONCLUSION

Anterior knee pain:

- A number of studies in which patella resurfacing was performed randomly have demonstrated that the results are not superior in terms of pain relief, whereas others have shown an increased incidence of anterior knee pain after total knee arthroplasties without patellar resurfacing.(LEVITSKY, et al., 1993)[2]
- In the present prospective, randomized study of patients treated with the PFC sigma prosthesis, the incidence of anterior pain in knees without patellar resurfacing(24%) was significantly higher than that in knees with patellar resurfacing(12%).
- The higher incidence of anterior knee pain in our series may be due to the fact that we used a different system for recording knee pain which is more objective and functional than the conventional systems.
- But this anterior knee pain did not have any relation to the pre op anterior pain and we support the different etiology theory for the origin of anterior knee pain.

PATELLOFEMORAL COMPLICATIONS:

- Complications associated with patellar resurfacing in total knee arthroplasty are over-restoration or under-restoration of patellar thickness, fracture, aseptic loosening, eccentric reaming and implant positioning, patellar tilt, maltracking, and/or instability, osteonecrosis, catastrophic failure of component, patellar polyethylene wear, patellar clunk syndrome or failure of extensor mechanism.(Schindler, 2012)[3]
- Attention to technical details and refinements of prosthetic design appear to have substantially reduced the rate of complications of patellar resurfacing, with recent studies demonstrating no appreciable risk of complications compared with that associated with nonresurfacing.(Holt & Dennis, 2003)[4]
- In our series we didn't have any reoperations or any major problems related to the patellofemoral joint. This is in gross discrepancy with most of the earlier studies conducted so far and more towards the recent study trends. We attribute this to our short follow up and greater technical detail and attention to the patellar component.

SELECTIVE RESURFACING

Traditional indications for not resurfacing the patella	Traditional indications for patellar resurfacing
-Short, thin built patient -Younger age -Osteoarthritis or inflammatory arthritis -Well preserved patellofemoral articular cartilage noted intraoperatively -congruent patellar tracking noted intraoperatively -Size or thickness of patella inadequatefor resurfacing	-Older age -Anterior knee pain or other patellofemoral symptoms -Patellofemoral radiographic changes -Inflammatory arthropathy (rheumatoid arthritis) -Obesity -Intraoperative patellar maltracking -History of patellar subluxation or dislocation

(Keblish, et al., 1994)[5]

Our study disregards most of these indications for use as a pre operative indicator for decision making. Age , obesity and preoperative anterior pain in the knee did not predict either a lower knee score or postoperative anterior pain. These three factors commonly have been cited as key in the decision whether toresurface the patella when the so-called selective resurfacing approach is used.

Since all our patients were of primary osteoarthritis and our study indicates that patients with resurfacing fare better in terms of anterior knee pain, it clearly makes non inflammatory arthritis a feasible indication for resurfacing.

Patella tracking and malformations have shown bad results in 2 of the non resurfaced groups as compared to none in the resurfaced group amounting to a significant factor for consideration of resurfacing.

Of course thickness of patella and intra operative complications remain a strong indication for retention of patella.

STUDY DESIGN

Although this study conclusively proves that the anterior knee pain in resurfaced knees is much less than non resurfaced knees, this cannot be the only criteria of providing blind resurfacing to all total knee arthroplasties. None the less it does take us in the direction than we should try to replace patella in primary tri compartmental osteoarthritis with no other contraindications.

More importantly factors such as age, obesity, pre op anterior knee pain or bilateralism should not govern our choice of resurfacing.

The only significant pre op indicator of a definitive resurfacing is patellar misalignment.

What is to be noted is that resurfacing is good as long as it is not complicated. We have been lucky enough to not face the complications in this study but they do have a significance.

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