

A Study To Compare The Clinical Outcomes Between Patellar Resurfacing Versus Non-Resurfacing In Posterior Stabilized Total Knee Replacement.

Dr. Sharat Balemane¹; Dr. Sushruth S.Srinivas²; Dr.Sivakumar³;
Dr. SomashekarV⁴

Preethi Hospitals, Madurai-625001 ,Tamil Nadu, India

Abstract:

Objective: To Compare The Clinical Outcomes Between Patellar Resurfacing And Non-resurfacing In Total Knee Arthroplasty(TKA).

Methods: A Total Of 63 Patients With Osteoarthritis Treated With TKA Between April 2013 To Sep 2013 Prospectively Studied And Followed Up For 1yr.The Patients Were Randomly Divided Into 2 Groups: The Patellar Resurfacing Group (Group A; N30) And The Patellar Non-resurfacing Group (Group B; N33).In The Non-resurfacing Group, The Osteophytes Of The Patella Was Removed, The Patella Was Reshaped To Match The Trochlea Of The Femoral Prosthesis And Circumpatellar Denervation Was Performed. In The Resurfacing Group, The Patella Was Resurfaced With A Cemented Poly Component .Anterior Knee Pain,Knee Society Score (KSS), Knee Society Function Score , Patient Satisfaction Were Compared Between The Groups .

Results: Of The 63 Patients Included, The Resurfacing Group A(N=30) And Non-resurfacing Group B(N=33). There Was Significant Difference In Anterior Knee Pain Scale And Incidence Of AKP Was Less In The Resurfacing Group. No Significant Differences Were Observed For Clinical Outcome For 1 Yr For Both Group . Patient Satisfaction Scale Was Significant In Resurfacing Group.

Conclusion: The Result Of Study Showed That Significant Improvement In Anterior Knee Pain Scale .But There Is No Significant Difference For Both Group In Clinical Outcome For 1 Yr Follow Up Except Satisfaction Scale. Patellar Resurfacing Recommended For Patellofemoral Pain And Sever Degeneration In Patellofemoral Side.

Keywords:Anterior Knee Pain; Clinical Outcomes; Knee Society Score; Patellar Non-resurfacing; Patellar Resurfacing; Total Knee Arthroplasty

I. Introduction

The optimal treatment of the patella in primary total knee arthroplasty (TKA) for osteoarthritis(OA) remains unclear (1)There are proponents for routine patellar resurfacing, for not resurfacing and for selective resurfacing. Some studies suggest that anterior knee pain remains a complication of TKR, with residual patellofemoral pain being present in between 5% and 45%(2) .Many surgeons used to recommend performing patellar resurfacing routinely, in order to decrease the incidence of anterior knee pain (AKP) and the rate of revision caused by patellofemoral problems.(3)

Patellar resurfacing can result in complications (including fracture, patellar component failure, osteonecrosis, instability, tendon rupture and patellar clunk syndrome)(4) therefore greater attention is being paid to patellar non-resurfacing. Modern prostheses are designed to incorporate the patella in a way that reduces contact stress between them, so that they interact like normal patellofemoral joints, consequently reducing postoperative AKP.(5)The aetiology of anterior knee pain after replacement is unproven but is generally thought to be related to the patellofemoral joint. Routine patellar resurfacing appears to be an option to reduce patellofemoral-related pain, but prospective randomized trials have not provided consistent results in the short- to medium-term(6).

Numerous controlled clinical trial have compared TKA outcomes between patellar non-resurfacing and resurfacing procedures, but results have been inconclusive, particularly regarding AKP and revision rate(7). In the present study, the non-resurfacing group patella was treated by removal of osteophytes .Patella was reshaped to match the trochlea of the femoral prosthesis and circumpatellar denervation, The resurfacing group the patella was resurfaced with a cemented component and the incidence of AKP and knee function between the patellar resurfacing and non-resurfacing groups was compared. We undertook a controlled clinical trial of patellar resurfacing in osteoarthritic patients treated by TKR. The aim was to produce evidence- based indications for patellar resurfacing in knee replacement. Our hypothesis was that patellar resurfacing would influence the disease- specific outcome of osteoarthritic patients undergoing knee replacement.

II. Patients And Methods

A randomized prospective double-blinded control study was conducted using predetermined outcome measures of knee replacement with and without patellar resurfacing. A total of 63 patients selected with osteoarthritis were treated with TKA between April 2013 to sep 2013 at Preethi hospital, Madurai . Inclusion criteria were patients with primary unilateral/bilateral TKA and those with degenerative osteoarthritis of the knee that did not respond to nonsurgical treatment. Exclusion criteria were patients with patellar resection, a history of patellar fracture, patellar instability treated with extensor reconstruction, high tibial osteotomy,a history of septic arthritis and osteomyelitis, serious medical illness limiting walking ability, and other lower-limb joint disease.Ethical approval was given by the Medical Ethics Committee of Preethi Hospital, Madurai.Written informed consent was obtained from all study participants

III. Surgical Procedures

All patients received the same type of cemented posterior cruciate sacrifice prosthesis (press-fit condylar [PFC; DePuyOrthopaedics, Warsaw, IN, USA]). A medial parapatellar approach was adopted through an anterior midline skin incision. Bone cuts and soft-tissue balancing were performed in the same sequence. In the patellar resurfacing groupA, patellar resurfacing was performed with a cemented inset PFC Sigma® oval dome component (DePuy Orthopaedics). The height of the patella was measured before and after operation, and in no case differed by more than 2 mm (fig 1.2.3)

In the patellar non-resurfacing groupB, patellar osteophytes were removed, the patella was reshaped to match the trochlea of the femoral prosthesis, and the soft tissue around the patella was cauterized using an electroscalpel to destroy the patellar innervation (circumpatellar denervation). Fig 4,5 Optimal patellar tracking was ensured by appropriate soft-tissuebalancing. If the patella subluxated during passive testing of the range of movement, a lateral release was performed ≥ 2.5 cm from the lateral patellar border. A standardized perioperative regimen was used for all patients. In detail, second generation 3 g/day cephalosporin was injected intravenously for 3 days from 1 day prior to the operation. After surgery, Active isometric quadriceps, initiative straight-leg raising and extending–flexing motion was encouraged in the immediate postoperative period. Walking with partialweight bearing was permitted 24 h postoperatively under the supervision of a physical therapist.

IV. Study Assessments

A total of 63 patients enrolled in study and randomized in a two groups (group A patellar resurfacing group n=30 . group B patellar non-resurfacing n=33) .Preoperative evaluation was performed using the Anterior knee pain scale. Knee Society Score, Knee Society Function Score and patient satisfaction score. Postoperative follow-up assessments were performed at 3 ,6 months and 1 yr .Data collected at 1 yr postoperatively were analyzed in the present study.

Demographic And Preoperative Data For Patients With Osteoarthritis, Undergoing Total Knee Arthroplasty With Patellar Nonresurfacing Or Resurfacing

Characteristic	RESURFACING GROUP N=30	NON-RESURFACING GROUP N=33
Age, years	59.5(51 to 68)	61(50-72)
Gender, males/females	12/18	13/20
Side, left/right	14/16	16/17
Body mass index, kg/m ²	31	30.7
Mean range of movement	10 -110	8-98
Anterior knee pain, no/yes	8/22	12/21
Anterior knee pain score	25	28
Total Knee Society Score	60.6	58.1
Knee Society Function Score	38.3	36.1





Fig: 1,2,3 Patellar Resurfacing Group- A.



Fig: 4,5. Patellar Nonresurfacing Group B



Fig 6.Circumpatellar Denervation

Postoperative Patient Data Comparing Knee Society Scores, Incidence Of Anterior Knee Pain, Patient Satisfaction Following Total Knee Arthroplasty With Patellar Non Resurfacing Versus Resurfacing

	RESURFACING GROUP(N=30)	NON RESURFACING GROUP(N=30)
Anterior knee pain, no/yes	20/10	12/18
Anterior knee pain score	5.1	14.1
Total Knee Society Score	92.1	91.6
Knee Society Function Score	83.4	82.2
Patient satisfaction score	79	60

V. Results

Data from 63 patients were reviewed. During followup for 1yr 3 patient with patellar non-resurfacing group were lost to follow-up. Hence total of 30 patient in patellar resurfacing group and 30 in the patellar non-resurfacing group considered. In the resurfacing group, the difference between pre- and postoperative heights of the patellae was ≤ 2 mm for each patient. There were no statistically significant between-group differences regarding age, gender, body mass index, history of AKP, preoperative Knee Society Scores (Table 1). The mean \pm SD duration of surgery was 82.3 ± 22.4 min in the non-resurfacing group and 86.7 ± 25.8 min in the resurfacing group; this difference was not statistically significant. Lateral retinacular release was performed in three patients in the non-resurfacing group and in one patient in the resurfacing group, with no significant between-group differences.

The findings of postoperative clinical evaluations are summarized in Table 2. At 1 years postoperatively, there were no significant between-group differences in terms of Knee Society Pain Score, Knee Society Function Score and Total Knee Society Score. But incidence of anterior knee pain was significantly

reduced in patellar resurfacing group . Anterior knee pain score and patient satisfaction score was significant differences in patellar resurfacing group .Superficial redness around the wound occurred in one patients in the non-resurfacing group and in two patients in the resurfacing group. After a 1-week course of oral antibiotics, superficial redness disappeared, with no evidence of infection. One patient in the resurfacing group developed an infection 6 months after surgery and arthroscopic washout was performed to eliminate it.

VI. Discussion

Although TKA achieves a high rate of clinical success, Still the controversy that remains regarding whether the procedure should include patellar resurfacing. The present study compared the clinical outcomes of two treatment regimens: patellar resurfacing and patellar non-resurfacing. No differences were found in relation to knee society score and knee society function score between the two methods.

Anterior knee pain is a key search term when looking for literature describing optimal patellar treatment in TKA. Patient with patello femoral arthritis and sever patellar degeneration may results in anterior knee pain. Results show incidences of AKP with the patellar resurfacing regimen and 3.3% – 44% with the patellar nonpresurfacing regimen. The postoperative AKP rate in the present study was 14.1% in the NON resurfacing group and 5.1% in the resurfacing group. There is significant difference in terms of anterior knee pain relief in patellar resurfacing group.

In the present study, replacing patella with the cemented polythene oval dome implant after proper assessment of patellar thickness with caliper measurement and implant is more medialised to prevent lateral tracking of patella and to prevent alteration in biomechanics of patellar tracking this also prevents incidence of anterior knee pain. In patellofemoral osteoarthritis, the patella tilts laterally due to the loss of cartilage on the lateral facet,which increases the pressure in the lateral patellofemoral joint.(8) It is reported that patellar thickness in the asians is less than that of Western populations, with the thinnest part being only 13 – 14 mm.(9) so patient selection for patellar resurfacing is also important.it is recommended to resurface patella only if patellar size is about 20-22 mm.

It has been suggested that patients be stratified to receive patellar resurfacing by the condition of their patellar articular cartilage and the presence of pre-operative anterior knee pain. Boyd et al 10 recommend selective resurfacing of the patella for patients with degenerative osteoarthritis involving the patella and in those with an inflammatory arthropathy.

VII. Conclusion

The result of study showed that significant improvement in anterior knee pain scale and incidence of anterior knee pain is less in resurfacing group. But there is no significant difference for both group in clinical outcome for 1 yr follow up except satisfaction scale. Patellar resurfacing recommended for patellofemoral pain and sever degeneration in patellofemoral side. It is recommended to resurface patella only if patellar size is about 20-22 mm. Otherwise patellar resurfacing doesn't have any added benefit.

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