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# Short Term Analysis of Clinical, Functional Radiological Outcome of Total Knee Arthroplasty and To Analyze the Differential Clinical, Functional and Radiological Outcome of Total Knee Arthroplasty with and Without Patellar Resurfacing

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***Abstract:*** *To analyze the clinical, functional & Radiological outcome of Total Knee Arthroplasty And the differential clinical, functional and radiological outcome of Total Knee Arthroplasty with and without Patellar Resurfacing. This is a prospective study done on patients who underwent Total Knee Arthroplasty under. Both the sexes were included in this study and a total of 43 patients with 61 knees were analyzed. All the knees received either a Cruciate Retaining or a Cruciate Substituting design. Knees with Fixed Flexion Deformity of more than 15 to 20 degrees and a Varus Deformity of more than 15 to 20 degrees usually received Cruciate Substituting design. no. of patients who underwent b/l TKR 19, no. of patients who underwent unilateral TKR 24, total number of the patellas resurfaced in our study are 12. The scoring systems used most commonly are-Hospital for Special Surgery rating system, Knee society scoring system, Insall modification of the K.S.S with a functional score, Oxford Knee Scoring system. For this study we have used the modified K.S.S. All patients underwent radiological evaluation . Pre op they had standard Anterio posterior full weight bearing x rays and lateral X rays. In addition to this all patients had a Skyline view or Merchants view, in order to evaluate the patellofemoral joint and arthritis. The age group ranged from 42 to 84 with an average age of 63.32 years. There was no intra op or immediate post op complications. 2 patients had Superficial wound Infection, after the suture removal, which was treated with wound lavage and secondary closure. There was no incidence of patella maltracking. The average pre op KSS score was 31.24 and post op KSS score at final follow up was 80.32 with a average gain of 49.08. The Pre Operative Functional score average was 28.55 and the Post Operative average at 6 months follow up is 87.26, with an average gain of 58.71. The Pre Operative Patello femoral score average is 11.23 and the Post Operative average is 26.39, the average gain is 15.16. The Pre Operative Average Range of movements is 74.63 and the Post Operative average is 101.53, with the average gain of 26.9. The primary objective of our method of knee replacement is to preserve normal kinematics of the knee with an implant whose geometry is compatible with the mechanics of the ligaments and muscles. Since in TKR the geometry of the femoral component duplicates normal anatomy and the articular surfaces of the tibial component allow unconstrained rotatory and anteroposterior displacement as dictated by the ligaments. Accurate bony cuts, restoration of mechanical axis of weight bearing and soft tissue balancing are fundamentals in achieving a successful TKR. The primary objective of our method of knee replacement is to preserve normal kinematics of the knee with an implant whose geometry is compatible with the mechanics of the ligaments and muscles. Since in TKR the geometry of the femoral component duplicates normal anatomy and the articular surfaces of the tibial component allow unconstrained rotatory and anteroposterior displacement as dictated by the ligaments. Accurate bony cuts, restoration of mechanical axis of weight bearing and soft tissue balancing are fundamentals in achieving a successful TKR. Similarly, there is no significant difference in the results in terms of Anterior knee pain, with Patellar resurfaced and non resurfaced TKR with reference to Knee society and Patellofemoral scores. With careful attention to surgical technique and balancing the knee, orthopedic surgeons should expect similar results with TKR whether they resurface patella or not. This study has 2 limitations, Short term follow-up of clinical results and Number of enrolled patients is small.*

***Keywords****: Total Knee Replacement(TKR), Hospital for Special Surgery rating system, Knee society scoring system, Insall modification of the K.S.S with a functional score, Oxford Knee Scoring system.*

## I. Introduction

**1.1: Factors influencing the outcome of Total Knee Replacement**

Pre Op status of the patient, Surgical technique and Post op Rehabilitation.

**1.2: Standard Surgical Steps**

Anterior midline incision, Median parapatellar approach, Excision of osteophytes, Soft tissue balancing, Appropriate bony resection, Trial reduction, Preparation for cementation, Cementing the original implants, Closure and Post operative rehabilitation.

**1.3: Surgical Approaches**

Median Parapatellar, Subvastus / Southern Approach/Quadriceps Sparing Approach, Midvastus, Minimal Invasive Approaches And Lateral Parapatellar Approach-(Severe valgus knee)

## II. Aim Of The Study:

To analyze the clinical, functional & Radiological outcome of Total Knee Arthroplasty and the differential clinical, functional & radiological outcome of Total Knee Arthroplasty with and without Patellar Resurfacing.

## III. Materials And Methods:

This is a prospective study done on patients who underwent Total Knee Arthroplasty. Both the sexes were included in this study and a total of 43 patients with 61 knees were analyzed.

All the knees received either a Cruciate Retaining or a Cruciate Substituting design. Knees with Fixed Flexion Deformity of more than 15 to 20 degrees and a Varus Deformity of more than 15 to 20 degrees usually received Cruciate Substituting design.

In this study we used either a **Depuy (Johnson & Johnson) Or Exatech Or Smith& Nephew** knees**.**

**3.1: Inclusion Criteria**

Primary osteoarthritis, Rheumatoid arthritis

**3.2: Exclusion Criteria**

Revision arthroplasty, Tumors, Knees that used hinged prosthesis or custom mega prosthesis were excluded.

**3.3: Patient Incidence**

No. of patients who underwent bilateral TKR were **19**, unilateral TKR were 2**4** and total number of the patellas resurfaced were **12**.

## IV. Results:

**4.1: Scoring Systems**

Hospital for Special Surgery rating system, Knee society scoring system, Insall modification of the K.S.S with a functional score and Oxford Knee Scoring system

For this study we have used the modified K.S.S

**Merits Of Knee Society Score:**

Simple yet exacting and objective. The rating is divided into separate knee and patient function scores. Pain ,Instability and ROM. Flexion contractures , Extension lag , Mal Alignment-Deductions. Increasing age and medical conditions will not affect the knee score. It includes a radiographic evaluation .

**4.2: Radiological Evaluation**

**Antero Posterior view – weight bearing**

Collateral ligament laxity or subluxation of tibia, Presence of medial and lateral osteophytes

**a) Lateral X- ray**

Osteophytes- Patellar, femoral, tibial surfaces, Antero posterior sizing of tibial and femoral components and Anterior curvature of femur.

**b) Sky Line View**

Detect pre-op mal tracking of patella

**c) Long-Leg A.P View**

The tibio femoral angle and Weight bearing axis

**4.3: Post Operative Protocol**

All patients received intrathecal and parental medications post op for control of pain. Drains were removed after 48 hours. High risk patients for DVT received thrombo-prophylaxis with LMWH. Mobilization with intensive physiotherapy in the form of quadriceps exercises and walking with knee brace and walker support, was begun on day 2 following surgery. Knee bending exercises and SLR was started on the 2nd post op day and increased as dictated by patients pain & progress. Walking without walker support was started 2-6 weeks post op.

**4.4: Follow Up**

Post op patients were evaluated at discharge and later at 6 weeks, 3months, 6 months and 1 year . Pre and post op x rays were also taken, the prosthesis bone interface was evaluated for the presence and progression of radiolucent lines. The progression of radiolucent lines was described as an increase in length or width or both of 2mm on sequential radiographs. A change in knee or prosthesis alignment was considered significant when in was 3* or more.

## V. Analysis

All patients were analyzed with pre op and post op KSS. 7 Rheumatoid and 55 osteoarthritic knees are studied. A total of 62 knees in 43 Patients were available for a minimum follow up of six months and a maximum of five years. 19 were Bilateral and 24 unilateral knee replacements. 16 male and 27 female patients are included in the study. 31 right knees and 31 left knees were replaced, 13 were cruciate substituting and 49 were cruciate retaining. 12 of the 62 knees, Patellas were resurfaced.

## VI. Results

The age group ranged from 42 to 84 with an average age of 63.32 years.

There was no intra op or immediate post op complications. 2 patients had Superficial wound Infection, after the suture removal, which was treated with wound lavage and secondary closure. There was no incidence of patella maltracking.

The average pre op KSS score was 31.24 and post op KSS score at final follow up was 80.32 with a average gain of 49.08. The Pre Operative Functional score average was 28.55 and the Post Operative average at 6 months follow up is 87.26, with an average gain of 58.71. The Pre Operative Patello femoral score average is 11.23 and the Post Operative average is 26.39, the average gain is 15.16. The Pre Operative Average Range of movements is 74.63 and the Post Operative average is 101.53, with the average gain of 26.9

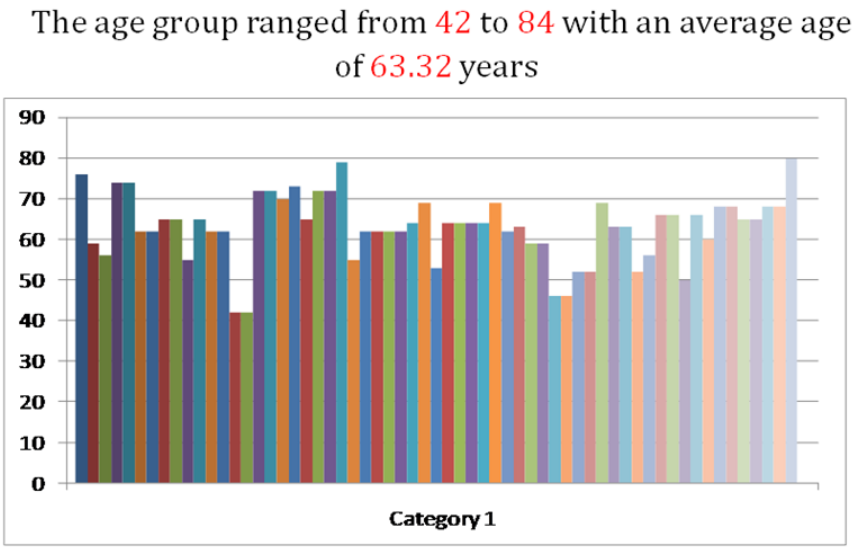
**6.1: Patellar Resurfacing** was done in 12 knees, indicated as Poor pre Operative Patellofemoral score, Radiographic assessment on skyline view, Intra Operative findings with respect to Patellar cartilage changes.

The Average Pre op Patellofemoral score in all the patellar resurfaced knees in our study is (6/30). 22 Patients had Patellofemoral arthritis clinically and radiologically, with Patellofemoral score of (6) of which only 12 of them have shown intra operative findings of cartilage changes. Though there is a minor change in the numericals between the per op & post op average PFS, The patient satisfaction in terms of symptomatic and functional(chair rising, stair climbing and Active SLR) satisfaction is same in both the groups.

## VII. Complications

Gabriel jackson et al in 2008 reported various complications such as patellar tendon rupture, collateral ligament injury, arthrofibrosis, skin necrosis, and deep infection. Our study had no major complication only 2 patients showed SUPERFICIAL wound infections, treated with wound lavage and secondary closure. 3 Patients with pre operative patella-femoral arthritis, who underwent Patella resurfaced TKA had anterior knee pain post operatively, which subsided with active quadriceps exercises by 3 & 6 months follow-up

## VIII. Tables




| | PRE OP | POST OP | PERCENTAGE GAIN |
|---|---|---|---|
| **KSS** KNEE SOCIETY SCORE | 31.24 | 80.32 | 61.1% |
| **FUNCTION** SCORE | 28.55 | 87.26 | 67.28% |
| **ROM** | 74.63 | 101.53 | 26.49% |
| **PFS** PATELLO FEMORAL SCORE | 11.23 | 26.39 | 57.45% |

Table-1 showing the various age groups

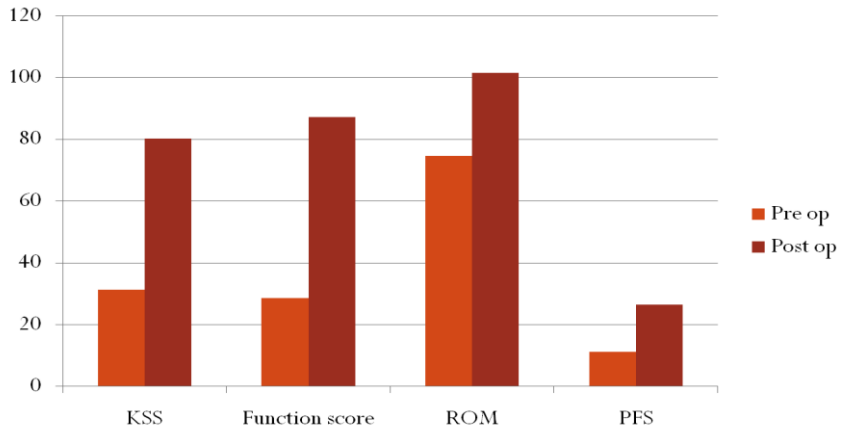
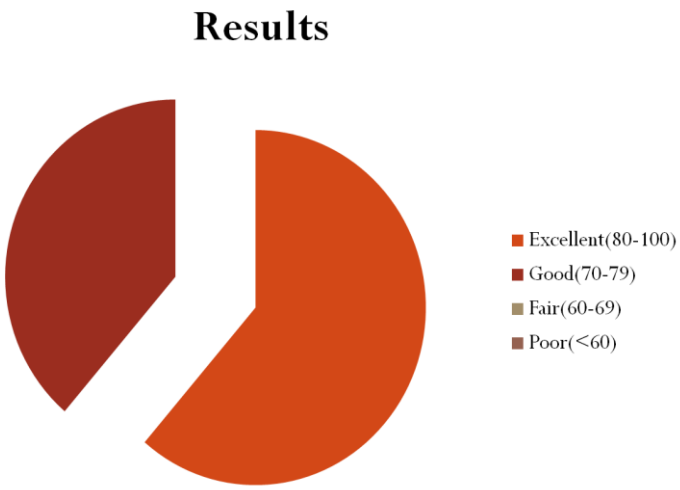



Table-2: showing average pre and post-op scores and percentage gain

Table-3: depicting average pre and post-op scores and ROM




## IX. Figures

Table 4: showing the overall results

**Case 1: Bilateral Rheumatoid Arthritis (Excellent Result)**

**Pre-Op X-Rays:**

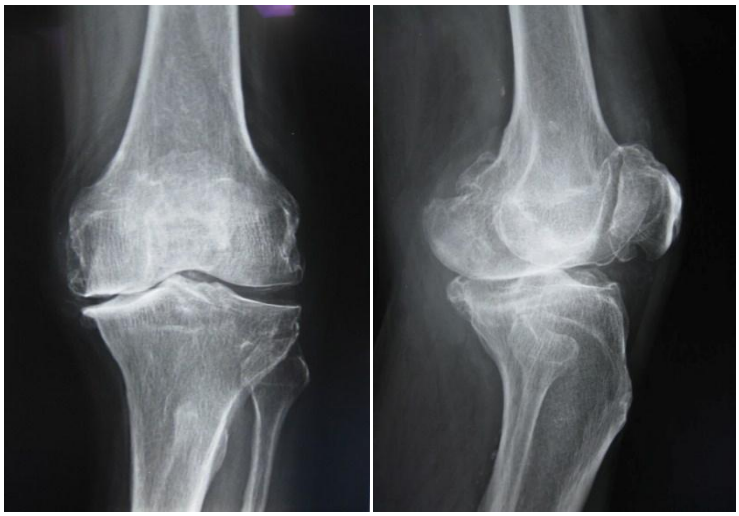
**POST-OP:**

**Knee bending of 100***

**Active SLR, has no extension lag**

1 yr follow up

**CASE 2: RIGHT OSTEOARTHRITIS KNEE**
**PRE-OP**



**POST-OP**

## X. Conclusion

- The primary objective of our method of knee replacement is to preserve normal kinematics of the knee with an implant whose geometry is compatible with the mechanics of the ligaments and muscles.
- Since in TKR the geometry of the femoral component duplicates normal anatomy and the articular surfaces of the tibial component allow unconstrained rotatory and anteroposterior displacement as dictated by the ligaments.
- Accurate bony cuts, restoration of mechanical axis of weight bearing and soft tissue balancing are fundamentals in achieving a successful TKA.
- With identical surgical technique, there is no significant difference in the results of Tkr with and without Patellar resurfacing and Cruciate Retaining or Cruciate Substituting TKA.
- With careful balancing of the flexion – extension gaps intraoperatively, there is no difference between CR and CS knees with respect to Range of Motion, Knee Society Clinical and Functional Scores.
- With identical surgical technique, there is no difference in the results in terms of Pain, function and Range of movements with Cruciate Retaining or Cruciate Substituting TKA with reference to Knee society clinical and functional score.
- Similarly, there is no significant difference in the results in terms of Anterior knee pain, with Patellar resurfaced and non resurfaced TKA with reference to Knee society and Patellofemoral scores.
- With careful attention to surgical technique and balancing the knee, orthopedic surgeons should expect similar results with TKA whether they resurface patella or not.
- This study has 2 limitations: Short term follow-up of clinical results and Number of enrolled patients is small.

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