

Study to Determine Prevalence of Patellofemoral Symptoms after Total Knee Arthroplasty with Non-Resurfacing of the Patella

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Abstract

Background: The controversy over whether or not to routinely resurface the patella during a total knee arthroplasty has persisted despite three decades of successful joint arthroplasty procedures. Advocates for routine patellar resurfacing admit the occasional need for secondary patellar resurfacing and declare increased prevalence of anterior knee pain in patients with non-resurfaced patellae as a cause for worry. Surgeons that leave the patella non-resurfaced cite avoidance of complications that include patellar fracture, avascular necrosis, patellar tendon injury and instability.

Objective: To study the prevalence of post-op patellofemoral symptoms like anterior knee pain, clunk and crepitus in patients underwent total knee arthroplasty with non-resurfacing of the patella.

Methods: Retrospective study was conducted among the patients who had total knee arthroplasty without resurfacing. Patients were examined by a specialist to check for any patellofemoral symptoms like anterior knee pain, clunk and crepitus. The knee pain questionnaire was used.

Statistical analysis: Descriptive statistics like mean, standard deviation and proportion and percentages.

Results: Total 156 study subjects participated in the study. Mean follow-up was 47.7 months (SD=4.5 months). The prevalence of anterior knee pain was 4.2%. Prevalence of patellar crepitus was 7.1%. No other complications were recorded in the study participants.

Conclusion: Prevalence of post-op PF pain, clunk and crepitus is low among who had total knee arthroplasty without resurfacing.

Keywords: Patellofemoral pain symptoms; Patella; Arthroplasty; Replacement; Knee

Introduction

Total knee arthroplasty (TKA) is one of the most commonly performed operations in adult reconstructive surgery. Three different approaches exist amongst orthopaedic surgeons with regards to patellar resurfacing: non-resurfacing, universal resurfacing and selective resurfacing [1].

Patellar resurfacing in total knee arthroplasty is a topic debated in the literature. Concerns include fracture, dislocation, loosening, and extensor mechanism injury [2].

There seems to be lack of consensus regarding patellar resurfacing among orthopaedic surgeons. Resurfacing is associated with good clinical outcome. Patellar resurfacing is not without drawbacks as it is associated with a small risk of patella fracture or need for patellar revision in the future. Complications of patellar resurfacing include patellar fracture, tendon rupture, osteonecrosis and soft-tissue impingement. Unsatisfactory results because of patellar tilt, mal tracking, instability, and polyethylene wear and patellar clunk syndrome have been reported [3]. Several prospective observational studies have shown that approximately 10% of patients are affected by significant patellofemoral complaints after TKA, despite patellar resurfacing [4,5].

Advocates for leaving the non-resurfacing of patella cite avoidance of complications that include patella fracture, avascular necrosis, patella tendon injury, and instability. Proponents of routine patella resurfacing cite the occasional need for secondary resurfacing procedures and the increased prevalence of anterior knee pain in patients with non-

resurfaced patellae as a cause for concern with leaving a patella non-resurfaced during knee arthroplasty [6].

Non-resurfaced patellae are subjected to high compressive forces, and may develop cartilage erosion after knee joint replacement. No studies found conclusive evidence that patellae affected by such changes become symptomatic after TKA. The decision to resurface the patella is subjective. The current literature on patellar resurfacing in TKA has failed to show clear superiority of patellar resurfacing or not resurfacing.

The main objective of the present is to study the prevalence of post-operative patellofemoral pain, clunk and crepitus following TKA without patellar resurfacing.

Methodology

The retrospective study was carried out in the private knee replacement center in Pune city, India. The study subjects were patient underwent total knee arthroplasty with patellar non-resurfacing. All

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Received December 04, 2015; **Accepted** April 23, 2016; **Published** April 25, 2016

Citation: Adkar N, Pandve HT (2016) Study to Determine Prevalence of Patellofemoral Symptoms after Total Knee Arthroplasty with Non-Resurfacing of the Patella. Evidence Based Medicine and Practice 1: 104. doi:10.4172/2471-9919.1000104

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patients were operated by posterior stabilized technique using fixed bearing implants. The study subjects were contacted by the investigators for the clinical follow-up. The study subjects were examined by the investigators. At time of the follow-up the detailed interview was taken by the investigators regarding patellofemoral symptoms like anterior knee pain, clunk and crepitus.

Study Tool

The Anterior Knee Pain Questionnaire looked into the activities exerting the greatest strain on the patellofemoral joint. On the basis of the responses to the Anterior knee pain questionnaire, the knees were grouped into three pain related categories: (1) pain free, (2) anterior knee pain and (3) knee pain of some other origin than patellofemoral joint. Knees marked with “0” to question 1 were considered as pain free. The remaining group with responses “1,” “2,” or “3” to question 1 consisted of painful knees and was further subdivided into two. Anterior knee pain was diagnosed if in addition to response “1,” “2,” or “3” to question 1 either “1” or “2” was chosen to all of the remaining questions (2–6) of the Anterior Knee Pain Questionnaire. The rest of the knees with the responses “1,” “2,” or “3” to question 1 denoted knee pain of some origin other than patellofemoral joint [7].

Statistical Analysis

All relevant data of patients was collected and compiled Descriptive statistics, including mean and standard deviation (SD) were used for continuous variables. For categorical variables, percentages (%) and absolute (n) frequencies were presented. The statistical software Primer of Biostatistics was used for statistical analysis.

Ethical Aspects

The study was conducted according to Guidelines of the Helsinki Declaration and of Good Clinical Research Practice. The research study was approved by independent ethical committee. All the study participants were told about the nature and outcome of study and written informed consent was taken.

Results

Total 156 study subjects were included in the present study. 94 study subjects were males. The mean age of the male study subjects was 73.8 years (SD=5.6 years). 72 study subjects were females. The mean age of the female study subjects was 70.4 years (SD=7.2 years) (Tables 1-3).

Sr. No.	Gender	Frequency	Percentages
1.	Male	94	60.26
2.	Female	72	39.74
	Total	156	100

Table 1: Gender-wise distribution of study subjects (n=156).

Sr. No.	Gender	Mean Age (in years)	Standard Deviation (in years)
1.	Male	73.8	5.6
2.	Female	70.4	7.2

Table 2: Mean Age of the study subjects (n=156).

Sr. No.	Patellofemoral Symptoms	Percentage
1.	Anterior Knee Pain	4.1
2.	Patellar crepitus	7.1
3.	Patellar clunk	Nil

Table 3: Distribution of the study subjects as per Patello-femoral symptoms.

The mean follow-up period was 47.7 months (SD=4.5 months)

Total 137 (87.4%) study subjects were pain free at the time of the follow-up. Pain free female study subjects were more compared to male study subjects.

Prevalence of anterior knee pain was 4.1%. Prevalence of patellar crepitus was 7.1%, prevalence of patellar clunk was nil.

4.2% males and 4.3% females were suffering from anterior knee pain. 3.4 % males had patellar crepitus and only 4.3% study subjects at patellar crepitus.

Discussion

In the present study prevalence of patellofemoral symptoms such as anterior knee pain, patellar clunk and patellar crepitus was found to be low following total knee arthroplasty with non-resurfacing of the patella Burnett et al. conducted a randomized clinical trial to determine long-term outcome differences of patella resurfacing versus nonresurfacing in patients undergoing bilateral total knee arthroplasty. Trial found no differences with regard to range of motion, Knee Society Clinical Rating Score, satisfaction, revision rates, or anterior knee pain. Thirty-seven percent of patients preferred the resurfaced knee, 22% the no resurfaced knee, and 41% had no preference. Two patients (7.4%) in the no resurfaced group and one patient (3.5%) in the resurfaced group underwent revision for a patellofemoral-related complication. Equivalent clinical results for resurfaced and no resurfaced patellae in total knee arthroplasty were demonstrated in this 10-year randomized clinical trial [8].

Khan and Pradhan carried out the retrospective review of 765 patients who had total knee replacement with/without resurfacing. Patients were asked about both pre-operative pain and also post-operative pain 5 years after the operation. Patients were examined by a specialist nurse at 5 years post-operatively to check for any patellofemoral clunk/crepitus. 688 patients (89.9%) had pre op PF pain. Out of 688 patients, 449 had resurfacing (R) while 239 did not have resurfacing (NR). Incidence of post op PF pain was 13.3% in the R group while 13.6% in the NR group. Incidence of post op PF clunk in the R group was 10.4% while it was only 1.3% in the NR. (Statistically significant p<0.005 compared to R group). Incidence of post crepitus in the R group was 13.5% while it was 17% in the NR. 77 patients (10.1%) had no pre op PF pain. Out of 77 patients, 54 had resurfacing while 23 did not have resurfacing. Incidence of post op PF pain was 8.5% in the R group while 8.3% in the NR. Incidence of post op PF clunk in the R group was 12.7% while it was only 8.3% in the NR. Incidence of post crepitus in the R group was 14.8% while it was 8.3% in the NR. (Statistically significant p<0.005 compared to the R group) [9].

Smith et al., also carried out a prospective randomised trial of 142 patients who had total knee replacement with and without patella resurfacing using the Profix total knee system (159 procedures). The patients were followed up for three to seven years, with a mean follow-up period of four years. They were assessed using the knee pain scale and the knee society clinical rating system. There was no demonstrable benefit of patella resurfacing compared to patients who were unresurfaced. Both groups had comparable number of patients with post-operative anterior knee pain (30.1% in resurfacing and 20.9% in the non-resurfacing groups) [10].

Li et al. suggested that when compared with patellar nonresurfacing TKA, patella resurfacing TKA has no advantages in terms of relieving pain, lowering revision rate and improving knee function during

a minimum 9-year follow-up. Patellar nonresurfacing (including removal of patellar osteophytes, patellar partial lateral facetectomy and circumpatellar denervation) can obtain satisfactory outcomes in TKA. In addition, patellar no resurfacing can easily be converted to patellar replacement, if AKP recurs [11].

Conclusion

In the present study, majority patients who underwent TKA without patellar resurfacing has not shown any patellofemoral symptoms like anterior knee pain, clunk and crepitus. Prevalence of patellofemoral symptoms was low in the present study.

Limitation

This observational study is conducted at only one knee arthroplasty center.

Acknowledgements

Authors are extremely grateful to the study subjects who had given their precious time.

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