

Results of Patella Surfacing Versus Non-Surfacing in Total Knee Replacement

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Abstract

Objective: To compare the functional outcomes of patients after the procedures by resurfacing and not resurfacing the patella during the surgery, **Background:** The-total-knee arthroplasty (TKA) - is the-prosthetic-replacement of patellofemoral and the femorotibial compartments with an inert mechanical structure, to enable it to restore functional mobility and indolence, restoring its prior autonomy. TKA has advanced, and with it, the implants and friction torques have improved, ensuring the prosthesis' life and durability. Study Design: retrospective cohort study, **Place And Duration:** This study was conducted in Liaquat National Hospital and Medical College Karachi from October 2022 to October 2023, **Methodology:** This study includes 57 patients and 60 knees who underwent TKA. The patients of primary osteoarthritis either primary or traumatic origin were included in the study. The information regarding the TKA like -inflammatory-joint-diseases-and-trauma-history-, -medical and surgical history, primary/secondary gonarthrosis, the affected side, -, -the-surgical-technique-, -radiological-assessment (knee-radiograph-the -anterior/posterior -view- and lateral view), - and clinical Knee Society Score (KSS) were recorded. The data was entered and analyzed using SPSS version 26.0, **Results:** The-BMI-of the patients ranged from 19 kg/m² to 38 kg/m²(mean and SD= 29.6±1). There were 44 (73.33%) female and 16 (26.67%) male in the study. There were 32 (53.33%) left, 24 (40%) right and 4 (6.67%) bilateral knees in the study. We observed that in resurfaced group, 2 (9.52%) cases observed anterior pain, 3 (14.29%) 1(4.76%) and 1(4.76%) observed infection, limping and stiffness respectively. Average postoperative mobility amplified from 86 to °106.7° with an average increase of 106° and - 108° in-resurfaced-cases-and-non-resurfaced-cases respectively. **Conclusion:** We conclude that the replacement patella is expensive procedure with delayed recovery time. However, there were no any functional differences of functional outcomes across the procedures used in the study. Therefore it is the discretion of the surgeon according to his expertise to opt for the procedure aligned with the condition of the patient.

Keywords: Total Knee Arthroplasty, Resurfacing Patella, Functional Outcome.

Introduction

The-total-knee arthroplasty- is the-prosthetic-replacement of patellofemoral and the femorotibial compartments with an inert mechanical structure, to enable it to restore functional mobility and

indolence, restoring its prior autonomy [1]. TKA has advanced, and with it, the implants and friction torques have improved, ensuring the prosthesis' life and durability. Traditionally the designs used in TKA resulted in discomfort in anterior knee on account of not being aligned with patellofemoral joint.

Progressively in 1970s, the resurfacing of patella in TKA was implemented to provide the patient relief from the discomfort [2].

As a result, the surgical technique for TKA now includes systematic replacement of the patellar surface [3]. Recent designs, such as patella replacement, have been shown to lessen the occurrence of anterior knee discomfort. This approach, however, introduces new hazards, including infection, patella fracture, extensor mechanism disruption, patellar component loosening, and patellar instability [4].

The scientific community is split on whether patella resurfacing is necessary or not. The literature research identified three approaches to patella management. The first approach entails always resurfacing the patella, the second method does not resurface it, and the third method only resurfaces the patella under certain conditions. Different facts support each of these tactics, but there is no agreement on the ideal management approach [5]. In this study we aimed to carry out a research where we can compare the functional outcomes of patients after the procedures by resurfacing and not resurfacing the patella during the surgery and compare the available research finding with our results.

Methodology

Using the total population sampling technique, this retrospective cohort study was carried out including 57 patients and 60 knees who underwent TKA. The patients of primary osteoarthritis either primary or traumatic origin were included in the study. However, we excluded the patients undergoing repeated TKA, malignant knee

tumors, knee septic arthritis and previous patellectomy. Also those who dropped out during the follow up were excluded. The patients' medical and surgical records were obtained from the hospital to record the sociodemographic factors and baseline information. The information regarding the TKA like inflammatory joint diseases and trauma history, medical and surgical history, primary/secondary gonarthrosis, the affected side,, the surgical technique, radiological assessment (knee radiograph, the anterior/posterior view and lateral view), and clinical Knee Society Score (KSS) were recorded. The data was entered and analyzed using SPSS version 26.0. We used the descriptive statistics mean and SD for quantitative variables and frequency and percentage for qualitative variables.

Results

There were 60 knees of 57 patients in our study. The patients age ranged from 47 to 78 years (mean and SD= 67±4.5 years). The BMI of the patients ranged from 19 kg/m² to 38 kg/m² (mean and SD= 29.6±1.7 years). There were 44 (73.33%) female and 16 (26.67%) male in the study. There were 32 (53.33%) left, 24 (40%) right and 4 (6.67%) bilateral knees in the study.

We used the exactly same type and structural make of the prosthesis. We performed the medial Para patellar approach and the lateral approach in 47(76.67%) and 13(23.33) cases respectively. There were 39 (65%) patella's not resurfaced and 21 (35%) were resurfaced. In all the cases we performed the denervation. While in 38% cases removal of osteophytes was performed. (As shown in Table I)

Table I: Baseline Characteristics of the Patients.

Variable	n	%
Gender		
Female	44	73.33
Male	16	26.67
Side of the Knee		
Left	32	53.33
Right	24	40.00
Bilateral	4	6.67
Etiologies of Gonarthrosis		
Primary senile osteoarthritis	46	76.67
Secondary osteoarthritis	14	23.33
Surgical Approach		
Medial Para patellar approach	47	78.33
Lateral Approach	13	21.67
Patella Management		
Not Resurfaced	39	65.00
Resurfaced	21	35.00
Descriptive Statistics	Mean	SD
Age (Years)	67	4.50
BMI	29.6	1.70

We observed that in resurfaced group, there were 2 (9.52%) cases of anterior pain, 3 (14.29%) 1(4.76%) and 1(4.76%) cases of infection, limping and stiffness respectively. While in not resurfaced group there were 2 (5.13%) cases of anterior pain, 9(23.08%), 3(7.69%), 1(2.56%) cases of infection, limping and stiffness respectively. Additionally, it was observed 1(2.56%) case of each stiffness, limited walking

distance, limited flexion, mal-alignment, clunk syndrome. There were no significant difference in patellar instability, rupture of the extensor mechanism, dislocation or fracture in both groups. (As shown in Table II)

We observed that the average postoperative mobility amplified from 86 to °106.7° with an average increase of 106° and 108° in resurfaced cases and non-

resurfaced cases. The global KSS score was 159.5 and 163 in resurfaced cases and non-resurfaced cases

respectively. There was decline in pain from 69% to 14% in all cases. (As shown in Table III)

Table II Description of postoperative Complications

Complications	Resurfaced cases		Non resurfaced Cases	
	n	%	n	%
Infection	3	14.29	9	23.08
Anterior pain	2	9.52	2	5.13
Limping	1	4.76	3	7.69
Loosening of the patellar component	1	4.76	1	2.56
Stiffness	1	4.76	1	2.56
Limited walking distance	0	0.00	1	2.56
Limited flexion	0	0.00	1	2.56
Malalignment	0	0.00	1	2.56
Clunk syndrome	0	0.00	1	2.56
Patella fracture	0	0.00	0	0.00
Extensor mechanism ruptures	0	0.00	0	0.00
Patellar instability	0	0.00	0	0.00

Table III: Functional Assessment.

Group	Resurfaced Cases	Not Resurfaced Cases
Postoperative flexion	106	108
Postoperative KSS	159.5	163

Discussion

In young adults, the knee injuries after trauma caused the sizable and fast progress in knee osteoarthritis. Young people are mobile, and want to stay in physically active status therefore soon after the trauma they require immediate relief. Because of that the surgeon is compelled to proceed with surgical options since non-surgical remedies do not provide effective relief [6]. This history is crucial to explore since it determines TKA indications, method selection, and surgical planning [1].

In the present study, the BMI of the patients ranged from 19 kg/m² to 38 kg/m² (mean and SD= 29.6±1.7). There were 44 (73.33%) female and 16 (26.67%) male. In line with our results, concordance findings were reported regarding the mean age in published research [7, 8].

In our study, there were 32 (53.33%) left, 24 (40%) right and 4 (6.67%) bilateral knee. It was reported that age is the most significant risk factor for gonarthrosis. The Loeser et al the specific cell signaling pathways are interrupted by the oxidative stress due to ageing and development of OA. Consequently the ability to maintain the extracellular matrix in cartilages is affected which subsequently results in gonarthrosis and cartilage degeneration. It is also reported that females are more prone to knee OA [9]. We notice similarities between our series and those in the literature. Anatomical variations, as well as genetic and hormonal issues, might all be contributing factors [10]. Anterior knee pain is one of the most common causes of long-term complications after TKA. It is at the choice of the patient to opt the procedure with the patellar replacement or without it. As a part of fact, the surgery may result in affecting the patellofemoral joints and its immediate relations. [11]. In the present study, we observed that in resurfaced group, there were 2 (9.52%) cases of anterior pain, 3 (14.29%) 1(4.76%) and 1(4.76%) cases of infection,

limping and stiffness respectively. There was decline in pain from 69% to 14% in all cases. Four meta-analyses found that those who had resurfacing had a lower incidence of anterior knee discomfort [12]. Additionally, one of the main complaints of the patients is the discomfort in knee. Therefore it is advised to abide patellar resurfacing in routine [13] since it does not necessarily relieve the pain [14]. However, Fuchs et al. showed up with the opinion that in the surgical procedure patellofemoral kinematics are disrupted causing the discomfort [15]. The association of the discomfort and related problems with the patellar resurfacing has reportedly been significant [16]. If the thickness of the patella is <12mm the chances for stress trauma may increase. While with higher thickness of patella there is more odds of developing discomfort besides loosening and subluxation [17].

Conclusion

We conclude that the replacement of patella is expensive procedure with delayed recovery time. However, there were no any differences of functional outcomes across the procedures used in the study. Therefore it is the discretion of the surgeon according to his expertise to opt for the procedure aligned with the condition of the patient.

Conflic Of Interest

Authors declared no any source of funding

Source of funding

No any

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