

To Evaluate Functional Outcome of Total Knee Replacement in Primary Osteoarthritis of Knee Joint

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Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to evaluate the clinical and functional outcome of total knee arthroplasty in this subset population.

Methods: The study was done on 50 patients in the Department of Orthopaedics, JNKTMCH, Madhepura, Bihar, India. Scoring system formulated by the Knee Society Knee Score was used to evaluate the patients before and after surgery. Both knee scores and functional scores are calculated with each amounting to a total of 100 points.

Results: The average pre op knee Clinical score was 48.2 which improved to a post op score of 84.82. The average pre-op knee Functional score was 66.4 which improved to an average post-op score of 82.64. At 6 month follow up, 35 patients (70%) had excellent, 11 patients (22%) had well, 2 patients (4%) had fair and 2 patients (4%) had poor results as per knee clinical score. At 6 month follow up, 37 patients (74%) had excellent, 5 patients (10%) had good, 2 patients (8%) had fair, and 2 patients (8%) had poor results as per knee functional score.

Conclusion: Primary Total Knee Arthroplasty improves the functional ability of the patients and the ability of the patient to get back to pre-disease state, which is to have a pain free mobile joint, as reflected by the improvement in the post- op Knee Clinical Score and Knee Functional Score. Also, Knee Society Score is an effective scoring system as it incorporates clinical and functional outcome following Total Knee Arthroplasty.

Keywords: Primary osteoarthritis, knee replacement, chronic joint disease

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Introduction

In most arthritic knees, some degree of instability, deformity, contracture or combination of these elements, can be found [1-3]. The common causes of arthritis of the knee include osteoarthritis (OA), rheumatoid arthritis (RA), juvenile rheumatoid arthritis, post traumatic arthritis or secondary osteoarthritis and other types of inflammatory arthritis. Osteoarthritis (OA) is a chronic degenerative joint disease and a major cause of disability in the elderly people. [4]

The rapid increase in the prevalence of this disease suggests that OA will have a growing impact on health care and public health systems in the near future. The concept of improving knee joint function by modifying the articular surfaces has received attention since the 19th century. The surgical technique has varied from soft tissue interposition arthroplasty to resection arthroplasty to surface replacement arthroplasty. In surface replacement arthroplasty different types of prosthesis were

developed to address the complex knee kinematics. Total knee arthroplasty (TKA) is now a reliable treatment for severe arthritis. Various systems are available with features regarding the geometry of the components, the degree of conformity of the articulating surface. Total joint replacement (TJR) for the management of OA is well-documented for improvements in patient benefits, reducing pain and improving physical function. [5-9]

Osteoarthritis is one of the most common chronic joint disease prevalent in Nepal. [10] Knee joint is one of the most commonly involved joint in osteoarthritis. [11] The prevalence of knee osteoarthritis is gradually increasing due to increase in the ageing and obese population. [12-13] Pain in the knees and loss of function are the major reasons why the patient seek medical attention. These problems can be addressed either pharmacologically or surgically. Pharmacological methods have satisfactory role in early osteoarthritis. It has been

found to have limited role in patient with severe osteoarthritis with alteration in the knee biomechanics. [14]

The aim of the present study was to evaluate the clinical and functional outcome of TKA in this subset population.

Materials and Methods

The study was done on 50 patients in the Department of Orthopaedics, JNKTMCH, Madhepura, Bihar, India for one year. Scoring system formulated by the Knee Society Knee Score was used to evaluate the patients before and after surgery. Both knee scores and functional scores are calculated with each amounting to a total of 100 points. Preoperative Radiological grading as advocated by Kellegran and Lawrence was used to evaluate the severity of the arthritis.

Inclusion Criteria

In our hospital total knee arthroplasty is being done for primary osteoarthritis. This includes varus as well as valgus knees

1. Primary Osteoarthritis
2. Age > 60 year
3. Kellegran and Lawrence score Grade 3 and 4

Exclusion Criteria

1. Infection, Non healing ulcer at same side or opposite limb
2. Systemic inflammatory arthritis
3. Neurological disorder
4. Any systemic infection
5. Preoperative patellectomy

6. Extension mechanism deficient
7. Secondary osteoarthritis of knee
8. Age < 60 years
9. post traumatic osteoarthritis knee

During the study period 60 knees were replaced (5 patients had B/L TKR) in 45 patients. Final study was on 50 patients. Detailed history of all patients was taken. The preoperative medical evaluation of all patients was done to prevent potential complications that can be life-threatening or limb threatening. Any limb length discrepancies were noted. Presence of any hip and foot deformities was assessed. The extensor mechanism was assessed for any quadriceps contractures. The knee deformities were examined for any fixed varus or valgus deformities or presence of any fixed flexion contracture. Standard guidelines were utilized to get knee radiographs – standing anteroposterior view and a lateral view and a skyline view of the patella. Any collateral ligament laxity, subluxation of tibia, presence of osteophytes, any bone defects in the tibia and femur and the quality of bone is assessed. All patients after thorough pre-op evaluation were taken up for surgery by the same surgical team under general or regional anesthesia, patient in supine position with knee flexed to 90 degree. Tourniquet was applied at the thigh region and sterile preparation done from thighs to toes and draped. The patient was assessed 1 month post operatively for any signs of post-operative infection. Once post-operative infection was ruled out clinically the patient was assessed clinically and functionally using the Knee Society Score at an interval of 6 months.

Results

Table 1: Mean pre and post-operative Knee Clinical Score

Knee Clinical Score	Mean
Pre-op.	48.2
Post-op.	84.82

The average pre op knee Clinical score was 48.2 which improved to a post op score of 84.82.

Table 2: Mean pre and post-operative Knee Functional Score

Knee Functional Score	Mean
Pre-op.	66.4
Post-op.	82.64

The average pre-op knee Functional score was 66.4 which improved to an average post-op score of 82.64.

Table 3: Distribution of subjects based on post-operative knee clinical score

Knee Clinical Score	Frequency (%)
Excellent	35 (70%)
Good	11 (22%)
Fair	2 (4%)
Poor	2 (4%)
Total	50 (100%)

At 6 month follow up, 35 patients (70%) had excellent, 11 patients (22%) had well, 2 patients (4%) had fair and 2 patients (4%) had poor results as per knee clinical score.

Table 4: Distribution of subjects based on post-op knee functional score

Knee Functional Score	Frequency
Excellent	37 (74%)
Good	5 (10%)
Fair	4 (8%)
Poor	4 (8%)
Total	50 (100%)

At 6 month follow up, 37 patients (74%) had excellent, 5 patients (10%) had good, 2 patients (8%) had fair, and 2 patients (8%) had poor results as per knee functional score.

Discussion

In most arthritic knees, some degree of instability, deformity, contracture or combination of these elements, can be found. [15,16] The common causes of arthritis of the knee include osteoarthritis (OA), rheumatoid arthritis (RA), juvenile rheumatoid arthritis, post traumatic arthritis or secondary osteoarthritis and other types of inflammatory arthritis. Osteoarthritis (OA) is a chronic degenerative joint disease and a major cause of disability in the elderly people. [17] The rapid increase in the prevalence of this disease suggests that OA will have a growing impact on health care and public health systems in the near future. The concept of improving knee joint function by modifying the articular surfaces has received attention since the 19th century. The surgical techniques have varied from soft tissue interposition arthroplasty to resection arthroplasty to surface replacement arthroplasty. In surface replacement arthroplasty different types of prosthesis were developed to address the complex knee kinematics. Total knee arthroplasty (TKA) is now a reliable treatment for severe arthritis. Various systems are available with features regarding the geometry of the components, the degree of conformity of the articulating surface. Total joint replacement (TJR) for the management of OA is well-documented for improvements in patient benefits, reducing pain and improving physical function. [18,19]

The average pre op knee Clinical score was 48.2 which improved to a post op score of 84.82. The average pre-op knee Functional score was 66.4 which improved to an average post-op score of 82.64. At 6 month follow up, 35 patients (70%) had excellent, 11 patients (22%) had well, 2 patients (4%) had fair and 2 patients (4%) had poor results as per knee clinical score. At 6 month follow up, 37 patients (74%) had excellent, 5 patients (10%) had good, 2 patients (8%) had fair, and 2 patients (8%) had poor results as per knee functional score. As with most techniques in modern medicine, more and more patients are receiving the benefits of total knee

arthroplasty (TKA). [20,21] This advances in the knee implant design and the surgical techniques for total knee replacement achieved successful results in reducing the pain and providing with a stable joint. After total knee arthroplasty, good relief was observed in older patients who were having difficulty in mobility because of degenerative arthritis. There was a substantial relief of joint pain, increased mobility, correction of deformity and an improvement in the quality of life of patients following total knee arthroplasty.

The scoring system combines a relatively objective knee clinical score that is based on the clinical parameters and a knee functional score based on how the patients perceives that knee function with specific activities. [22] In our study there was significant improvement of Knee Clinical Score and Knee Functional Score following primary Total Knee Arthroplasty in patients. At 6 month follow up, the component position and knee alignment was well maintained. We recommend long term follow up studies to further strengthen the study findings. Similarly in the study conducted by Farahini et al [23] significant improvement in knee society score was observed. Our findings also correlates well with study conducted by Yaratapalli et al²⁴ showing increased in Knee society score after TKA. Buz-Swanik et al²⁵, found that after total knee arthroplasty, most of the patients were able to reproduce joint position and significant improve in mobility was observed. These changes may result due to retensioned capsule ligamentous structures and reduced pain and inflammation. There was also significant improvement in the balance index postoperatively. In our study, all the patients treated with the posterior stabilized prosthesis, reproduced joint position more accurately when the knee was extended from a flexed position.

Conclusion

Primary Total Knee Arthroplasty improves the functional ability of the patients and the ability of the patient to get back to pre-disease state, which is to have a pain free mobile joint, as reflected by the improvement in the post- op Knee Clinical Score and Knee Functional Score. Also, Knee Society Score is an effective scoring system as it

incorporates clinical and functional outcome following Total Knee Arthroplasty.

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