Original Research Article

A study of functional outcome after Primary Total Knee Arthroplasty in elderly patients

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International Archives of Integrated Medicine, Vol. 3, Issue 7, July, 2016.

Available online at http://iaimjournal.com/
ISSN: 2394-0026 (P) **ISSN: 2394-0034 (O)**
Received on: 27-04-2016 **Accepted on:** 04-07-2016
Source of support: Nil **Conflict of interest:** None declared.
How to cite this article: Chandran R, Shetty SK, Shetty A, Balan B, Lawrence J Mathias LJ. A study of functional outcome after Primary Total Knee Arthroplasty in elderly patients. IAIM, 2016; 3(7): 297-301.

Abstract

Introduction: Osteoarthritis is thought to be the most prevalent chronic joint disease. Total Knee Arthroplasty (TKA) is now a reliable treatment for severe arthritis and is now commonly done for end stage arthritis of knee. The results of TKA are predictable in majority of cases, but with geriatric population, arthritis is often associated with other co-morbid condition along with age, which makes the results of TKA less predictable. So, the present study was conducted to evaluate the clinical and functional outcome of TKA in this subset of population.

Materials and methods: This prospective study was done at a tertiary care center of Mumbai. A total of 30 consecutive patients who consented and underwent TKA were assessed clinically, functionally and radiologically using the Knee Society Score at an interval of 6 weeks and 6 months. All the data was entered in Microsoft Excel sheet 2013 and analyzed using appropriate statistical tests using SPSS software ver. 21

Results: The average pre-op Knee Clinical Score (KCS) was 28.13 which improved to an average post-op score of 95.38. At 6 month follow up, 26 patients (87%) had Excellent, 3 patients (10%) had Good, and 1 patient (3%) poor results as per KCS. The average pre-op Knee Functional Score (KFS) was 41.53, which improved to a post-op score of 88.49. At 6 month follow up, 16 patients (53%) had Excellent, 11 patients (37%) had Good, 2 patients (7%) had Fair and 1 patient (3%) had poor results as per KFS.

Conclusion: Primary Total Knee Arthroplasty improves the functional ability of the old patient above 70 years 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.

Key words

Elderly, Functional Outcome, Knee Society Score, Total Knee Arthroplasty.

Introduction

Osteoarthritis is thought to be the most prevalent chronic joint disease. The incidence of osteoarthritis is rising because of the ageing population and the epidemic of obesity. Pain and loss of function are the main clinical features that lead to treatment, including non-pharmacological, pharmacological, and surgical approaches [1-4].

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 specific features regarding the geometry of the components, the degree of conformity of the articulating surface and the anchoring technique. It is now commonly done for end stage arthritis of knee. The results of TKA are predictable in majority of cases, but with geriatric population, arthritis is often associated with other co-morbid condition along with age, which makes the results of TKA less predictable [4].

There is a paucity of data in Indian literature as regards to results of TKA in elderly population. So, the present study was conducted to evaluate the clinical and functional outcome of TKA in this subset of population.

Materials and methods

This prospective study was done at a tertiary care center of Mumbai. A total of 30 consecutive patients who consented and underwent Total Knee Arthroplasty were assessed clinically and functionally using Knee Society score [5]. All primary Total knee Arthroplasties were performed using the Biomet Vanguard Knee prosthesis.

Inclusion criteria

- All patients above 70 years.
- Both bilateral and unilateral Total Knee Arthroplasty.
- Primary osteoarthritis

Exclusion criteria

- Age less than 70 years
- Secondary OA and any previous knee infection
- Intra-operative and Postoperative fractures. (Periprosthetic fractures)
- Associated neurovascular disorder of lower limb

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 drapped.

The patient was assessed 6 weeks 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.

All the data was entered in Microsoft Excel sheet 2013 and analyzed using appropriate statistical tests using SPSS software ver. 21.

Results

The majority of the patients were from the age group of 70-74 years which accounts for 40% of patients in our study. There was a female predominance in the ratio of 3: 2 in our study, accounting for 60% of the patients (non-tabulated). The average pre-op Knee Clinical Score (KCS) was 28.13 which improved to an average post-op score of 95.38. At 6 month follow up, 26 patients (87%) had Excellent, 3 patients (10%) had Good, and 1 patient (3%) poor results as per KCS (**Table - 1** and **Table - 2**). The average pre-op Knee Functional Score (KFS) was 41.53, which improved to a post-op score of 88.49. At 6 month follow up, 16 patients (53%) had Excellent, 11 patients (37%) had Good, 2 patients (7%) had Fair and 1 patient (3%) had poor results as per KFS (**Table - 3** and **Table - 4**). Infection was developed in only 1 (3.3%) patient after TKA (**Table - 5**).

Table – 1: Mean pre- and post-op Knee Clinical Score.

Knee Clinical Score	Mean	SD	Max.	Min.
Pre – op	28.13	7.54	14	39
Post – op	95.38	5.55	80	99

Discussion

Total Knee Arthroplasty is generally an effective procedure and is associated with substantial functional improvement. Elderly patients above 70 years who were having difficulty mobilising because of degenerative arthritic found good relief after Total Knee Arthroplasty. There was a substantial relief of joint pain, increased mobility, correction of deformity and an improvement in the quality of life of the patients following Total Knee Arthroplasty. With the varied amount of implant designs available, the posterior cruciate substituting design was found to be effective [6]. Buz Swanik et al. found that following total knee arthroplasty, patients were able to reproduce joint position and improve mobility significantly. These changes may result from the re-tensioned capsulo-ligamentous structures and reduced pain and inflammation. The balance index also improved significantly from the preoperative to the postoperative evaluation. The group treated with the posterior stabilized prosthesis more accurately reproduced joint position when the knee was extended from a flexed position. Retention of the posterior cruciate ligament does not appear to significantly improve proprioception and balance compared with those functions in patients with a posterior stabilized total knee design [7].

Table – 2: Distribution of Subjects based on post-op Knee Clinical Score.

Knee Clinical Score (KCS)	N	%
Excellent	26	86.7%
Good	3	10.0%
Fair	0	0.0%
Poor	1	3.3%
Total	30	100.0%

Table – 3: Mean pre- and post-op Knee Functional Score.

Knee Functional Score	Mean	SD	Max.	Min.
Pre – op	41.83	9.33	20	50
Post – op	83.79	8.62	60	90

Table – 4: Distribution of Subjects based on post-op Knee Functional Score.

Knee Functional Score (KCS)	N	%
Excellent	16	53.3%
Good	11	36.7%
Fair	2	6.7%
Poor	1	3.3%
Total	30	100.0%

Table – 5: Distribution of Subjects based on post-op Complications.

Complication	N	%
Yes (Infection)	1	3.3%
No	29	96.7%
Total	30	100.0%

In present study, 30 patients who met the inclusion criteria, all the knees were operated using a Posterior cruciate substituting design. Robert L Barrack et al. found that total knee arthroplasty with retention of the patella yielded clinical results that were comparable with those after total knee arthroplasty with patellar resurfacing [8]. Robert L Barrack, et al. concluded that postoperative anterior knee pain is related either to the Component design or to the details of the surgical technique, such as component rotation, rather than to whether or not the patella is resurfaced [9]. Nutton concluded that knee function was not improved by patella resurfacing when compared to a matched group of patients without resurfacing [10]. Wood, et al. concluded that total knee arthroplasty with patellar resurfacing exhibited inferior clinical results as compared to total knee arthroplasty with patellar retention. Total knee arthroplasty with patellar resurfacing exhibited significant limitation of knee extension, which was significantly associated with the presence of post-surgery anterior knee pain [11].

In our study, none of the patellas were resurfaced. All patellas were circumferentially denervated. There was no anterior knee pain in any of our subjects. The Knee Society Score was used to assess the outcome of Total knee Arthroplasty. The knee Society Score rating system was a logical outgrowth of the Hospital for Special Surgery (HSS) rating system. The Knee Society Score system separates findings in the operated knee with findings in the patients function. The system is subdivided into a knee clinical score that rates only the knee joint itself and a knee functional score that rates the patient's ability to walk and climb stairs. As such the knee clinical score is not artificially affected by co-morbid conditions. 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 [1]. In our study there was significant improvement of Knee Clinical Score and Knee Functional Score following primary Total Knee Arthroplasty in patients above 70 years. 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.

Conclusion

Primary Total Knee Arthroplasty improves the functional ability of the old patient above 70 years 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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