Original Article

An Observational Study of Results and Outcomes of Total Knee Replacement in Osteoarthritis Knee

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ABSTRACT

Background: Total knee replacement (TKR) is a surgical procedure with predictable outcomes. This observational study intended to review the outcome of total knee replacements performed in osteoarthritis knee patients and evaluate the postoperative clinical, functional and radiological results in the replaced knees and the preoperative and postoperative lower limb alignment correction achieved and the incidence of early complications. **Methods:** We selected 20 people (20 knees) from the outdoor clinic who gave their informed consent for the study and satisfied our criteria. They were evaluated using the knee society score (KSS), preoperatively and postoperatively at the 6 months follow up and the data was analysed. **Results:** In our study we observed that the mean knee society score improved from 27.4 to 81 and the mean functional score improved from 30 to 79.3. The knee flexion range increased from 50* to 125*. Postoperatively all the varus knees were aligned except 3 knees. Complication rate was 5%. We found a significant increase in the knee society score after total knee replacement compared to the preoperative scores. **Conclusion:** We conclude that total knee replacement is a reliable and safe modality of treatment and can be performed with results comparable to the other global studies.

Keywords: Total knee replacement, osteoarthritis, knee society score.

INTRODUCTION

With the advances in science, the life span of people is increasing, leading to a boost in the numbers of the geriatric population.[1] In our country there is an increase in the number of people suffering from osteoarthritis; and also a considerable increase in the body mass index (BMI) which when combined with sitting cross legged and squatting play a strong role in joint degeneration. Total knee replacement has emerged as a reliable, longer lasting method of knee arthroplasty, with excellent pain relief and functioning. So this study is intended to do a review of the results of total knee replacement done on patients of osteoarthritis.

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Aim and Objectives: This study aims to present data on the outcome of total knee replacements regarding the postoperative functional results, correction in the alignment and early complications performed at our institution, from june 2016 to October 2018 (which includes a 6 month follow up period).

Inclusion and exclusion Criterion
All patients attending our institute who were above the age of 60 years and required TKR as a treatment modality for degenerative arthritis of knee joints and received at least 6 months trial of conservative treatment with failure to relieve pain were taken up for the surgery. Patients with any local or systemic infective condition, other joint abnormalities,referred pain from spinal pathologies, neuropathic arthritis or comorbid conditions rendering the patient unfit for surgery was exempted from our study. Informed consent was obtained from all the patients who participated in the study.

MATERIALS AND METHODS

Patients who fulfilled the above said criteria were evaluated clinically, radiologically and through laboratory tests to ascertain need for the surgery and fitness to undergo the procedure. All patients were treated with the same category of medication, similar anaesthetic (combined spinal & epidural anaesthesia) and intraoperative techniques. We used the implant & instruments of the same company (smith & nephew). Subjects were evaluated preoperatively and postoperatively on follow up at 14 days, 1 month, 2 month, 3 month & 6 months, on their recovery and progress using Knee society score. A preoperative examination and assessment proforma was made and used in all cases. Assessment was done by the knee society score (KSS) (Insall, 1989), which is divided into three sections: a clinical knee score which assesses pain, range of motion and stability in anteroposterior and mediolateral directions and has deductions for flexion contractures, extension lag and malalignment, to have a maximum score of 100 points; a functional score which assesses the ability to walk and ascend and descend stairs and deductions are made if patient needs ambulatory aids to walk, and has a maximum score of 100 points. Scores between 100 & 80 are excellent; between 79& 70 are good; between 69 & 60 are fair and less than 60 are poor. In radiological assessment alignment, femoral notching in lateral view and implant sizing were looked for. Implant loosening was not looked for in our study in view of the short follow up period.

Surgical technique: Under tourniquet control, a midline skin incision was given followed by a medial parapatellar approach to facilitate eversion of the patella. ACL, PCL and both the menisci were removed to perform a posterior cruciate substituting TKR. Ligament balancing was performed prior to bone resection. Distal femoral cut was given at 5* of valgus to the anatomical axis and perpendicularly in sagittal plane. This was followed by anterior-posterior and chamfer cuts, femoral notch cut and peg holes and tibial notch cut. The tibial cut was given at 90* to the long axis and 7* of posterior sloping and sizing was done. Extension and flexion gaps were checked. After this trial implants were placed and stability was checked. Then the appropriate size original implants were fixed with cement. Resurfacing of patella was done and knee joint was closed by ranawat method. Postoperatively the knee was immobilized in a Jones compression bandage and knee immobilizer and postoperative check radiographs were taken. Patient was advised to continue static quadriceps exercises. On the third postoperative day the patient was made to ambulate with the help of walker. On the second postoperative day the wound was inspected and epidural catheter and drain (if present) was removed and knee flexion was started. DVT prophylaxis was given in the form of low molecular weight heparin (enoxaparin 40 mg once s/c) for ten days after 12hrs of epidural catheter removal. On the fourteen postoperative day intravenous antibiotics were changed to oral antibiotics and were given for another 14 more days. Patient was discharged on the 14th postoperative day after sutures/ staples were removed. Patient was followed up every month for 3 months and then at 6 months, more frequently if complications occurred.
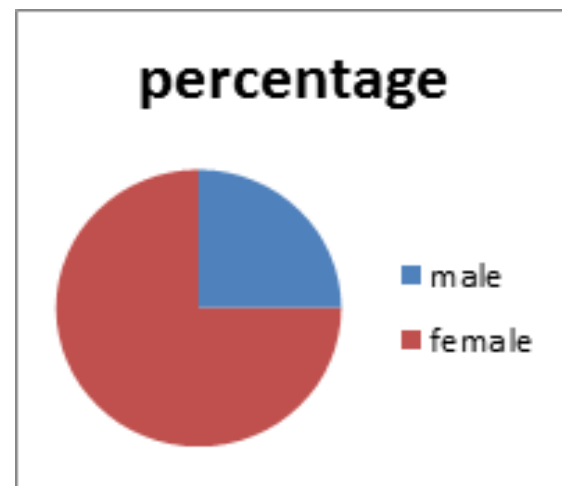
RESULTS

Distribution of patients according to AGE:

Age (years)	Number of knees	% percentage
60-65	13	65
66-70	6	30
>70	1	05

BMI: Mean weight of subjects in the study was 53.1 ± 9.8 kg, mean height was 146.3 ± 8.1 cm and mean BMI was 23.6 ± 3.1. 50% of subjects in the study had normal BMI, 40% were overweight and 10% were obese.
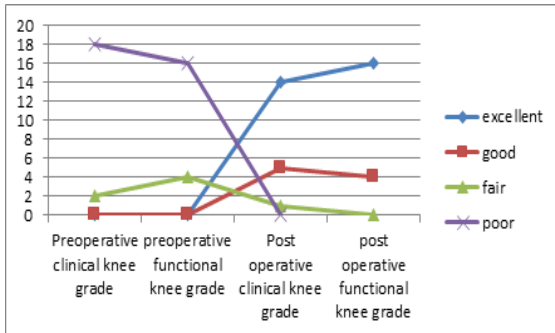
Gender:

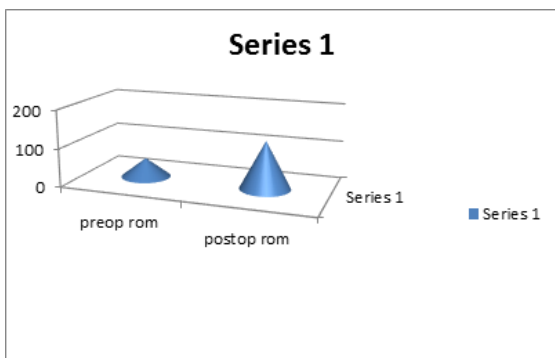**Pre & Post-Operative Comparison Of Knee Society Scores**:

Knee society score	Mean	SD
Pre op clinical score	27.4	20.6
Post op clinical score	81	7.9
Pre op functional score	30	18.7
Post op functional score	79.3	8.4

PRE & POST OPERATIVE KNEE SOCIETY GRADING

Range Of Motion

Complication: 1 patient had superfitial wound infection which was treated with superfitial debridement and antibiotics for 1 month and responded well.

Clinical Photographs
Pre OP:

Immediate Post OP:

6 months follow up:

DISCUSSION

Comparative overall results In a study conducted by Suhail et al (2009), the outcome according to the clinical knee score was 77.3% knees excellent, 21.3% good and 1.3% fair. The outcome according to the functional knee score was 64% knees were excellent, 29.3% good and 6.7% fair.[4] In an another study conducted by Williams et al (2010) the clinical knee score rated 92% knees as excellent, 1.6% good and 6.5% fair.[5] Senan et al (2011) also showed similar outcome, the clinical knee score rated 60% knees excellent, 13.3% good, and 13.3% poor and the functional knee score outcome showed 34.6% knees as excellent, 46.1% good and 46.1% poor.[6] In a series of cases studied by Reddy et al (2013) the outcome according to the functional knee score was found to be excellent in 79.4% knees, good in 5.8%, and poor in 5.8%.[7] In our series the clinical knee score graded 70% knees excellent, 26.7% good, 3.3% fair, and functional knee score showed 80% knees excellent, 16.7% good and 3.3% fair which were comparable to results of other studies performed in India and abroad. A study conducted by Smith et al in 2008 showed the mean clinical knee score was 39.0 preoperatively and 93.0 postoperatively and mean functional score was 51.07 preoperatively and 70.0 postoperatively.[8] In an another study performed by Kim T. H. et al in 2008, the mean clinical knee score increased from 30.9 preoperatively to 94.2 postoperatively and the mean functional score improved from 44.9 preoperatively to 84.7 postoperatively.[9] In a series of cases studied by Kim Y. H. et al in 2010, it was seen that the mean clinical knee score was 35.3 preoperatively and 94 postoperatively and mean functional score was 44.2 preoperatively and 83 postoperatively.[10] In our series it was noted that the mean knee society scores were comparable to the means of other studies performed elsewhere; mean clinical knee score was 27.4 preoperatively and 79.3 postoperatively and mean functional score was 30 preoperatively and 81 postoperatively. A Study conducted by Li et al in 1999 showed that mean preoperative ROM was 88* and mean postoperative ROM was 100*.[11] In another study by Nutton et al in 2007 showed that the mean ROM had increased from 126* preoperatively to a mean postoperative ROM of 136*.[12] In a series of cases studied by Kim et al in 2008 showed that mean preoperative ROM was 117.3* and mean postoperative ROM was 134.7*.[9] Williams et al in 2010 showed that mean preoperative ROM was 99* and mean postoperative ROM was 115.5*.[5] It was noted that the range of movement achieved after total knee arthroplasty in our study was comparable to the results of other studies performed elsewhere. In our study the mean preoperative ROM was 50* and mean postoperative ROM was 125*. The slight decrease may be attributable to the ill compliance of patients regarding postoperative rehabilitation.

CONCLUSION

Patients have pain relief which is often total, with an increased walking ability and stability of the joint more than 90% of the patients had a good to excellent score. TKR has an excellent outcome in degenerative arthritis. Complication rate of 5% is less compared to other studies. Complications were seen in 1 patients. KSS scoring system is found to be relevant, simple but more exacting and more objective. We conclude that total knee replacement is a reliable and safe modality of treatment and can be performed with results comparable to the other global studies provided there is adequate expertise and follow up by the patient to detect any complications early, before they occur.

REFERENCES

1. Agrawal A. Disability among the elder population of India: A public health concern. J Med Soc. 2016; 30:1519.
2. Back DL, Cannon SR, Hilton A, Bankes MJK, Briggs TWR. The Kinemax total knee arthroplasty. J Bone Joint Surg [Br]. 2001; 88(3):359-363.
3. Hooper G, Rothwell A, Frampton C. The low contact stress mobile-bearing total knee replacement. J Bone J Surg [Br]. 2009; 91(1):58-63.
4. Suhail A, Idham H, Norhamdan MY, Shahril Y, Masbah O. Early Functional Outcome of Total Knee Arthroplasty. Malays Orthop J. 2009; 3(2):33-35.
5. Williams DH, Garbuz DS, Masri BA. Total knee arthroplasty: Techniques and results. B C Med J. 2010; 52(9):447-54.
6. Senan V, Nessiah S, Vikraman CS, Kumar M, Senan M. TKR: Clinical and functional outcome in chronic arthritic knees. Kerala Journal of Orthopaedics. 2011; 24(1):23-26.
7. Reddy AK, Rao AS, Reddy AVG. Functional Outcome of Total Knee Replacement in Patients with Rheumatoid Arthritis -A Prospective Study. Journal of Medical Thesis. 2013; 1(1):20-22.
8. Smith AJ, Wood DJ, Li MG. Total knee replacement with and without patellar resurfacing. J Bone Joint Surg [Br], 2008; 90(1):43-49.
9. Kim TH, Lee DH, Bin SI. The NexGen LPS-flex to the knee prosthesis at a minimum of three years. J Bone Joint Surg [Br]. 2008; 90(10):1304-10.
10. Kim YH, Choi Y, Kim JS. Comparison of standard and gender-specific posterior-cruciate-retaining high-flexion total knee replacements: J Bone Joint Surg [Br]. 2010; 92(5):639-45.
11. Li PLS, Zamora J, Bentley G. The results at ten years of the Insall-Burstein II total knee replacement. J Bone Joint Surg [Br]. 1999; 81(4):647-53.
12. Nutton RW, van der Linden ML, Rowe PJ, Gaston P, Wade FA. A prospective randomized double- blind study of functional outcome and range of flexion following total knee replacement with the NexGen standard and high flexion components. J Bone Joint Surg [Br]. 2008; 90(1):37-42.
13. Kiran EK, Malhotra R, Bhan S. Unilateral vs one stage bilateral total knee replacement in rheumatoid and osteoarthritis- A comparative study. Indian J Orthop. 2005; 39(1):14-20.