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A short term analysis of the clinical and functional outcome following total knee arthroplasty for osteoarthritis

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Abstract

Aim: The aim of this short term prospective study is to present a data on the clinical and functional outcome of total knee arthroplasty done for primary osteoarthritis.

Method and Material: It is a Prospective study was conducted at Babuji and Chigateri General Hospital attached to JJM Medical College, Davangere for a period of two years from July 2018 to July 2020. Patients with primary Osteoarthritis of the knee joint, undergoing TKA were included in the study. Patients with less than 6 months follow up and patients lost to follow up were excluded from the study.

Result: A total of 30 knee replacements performed in 22 patients were included. The average age is 62.4 yrs at the time of surgery. There were 17 females and 5 males in our study. 12 Patients had unilateral total knee replacements. 6 patients underwent simultaneous bilateral total knee replacements in a single stage. 3 patients had staged bilateral total knee replacements. 22 Knees (73.33%) were completely pain free at final follow up, 6 knees (20%) had mild (or) occasional vague pain, 2 knee (6.66%) had pain for climbing stairs only. Average Pre op ROM was 86.4 degrees which improved to 99.6 degrees. All the 30 knees were stable anteroposteriorly both pre & post operatively. 4 knees were unstable mediolaterally which was corrected post operatively. 28 knees had varus deformity of avg 11.08 degree and 2 knee had valgus deformity of 20 degrees. All the knees were correctable to an average postoperative valgus of 4.4 degrees. Knee society clinical scoring system the average score for all the 30 knees was 35 points preoperatively and average score was 93 points at final follow up with 26 knees (86.66 %) had excellent final scores. The average preoperative functional score was 36 which improved to an average functional score of 90 postoperatively at final follow up with 25 knees (83.33 %) had excellent functional scores. No evidence of malalignment (or) loosening in the femoral and tibial components was noted.

Conclusion: This is a study with a short term follow up ranging from 6 months to 26 months. Functional results have been good irrespective of the severity of the preoperative deformities. Patient satisfaction in terms of pain relief, and improvement in walking and stair climbing ability is good following total knee arthroplasty for osteoarthritis.

Keywords: Osteoarthritis, Total knee replacement, KSCS, KSFS

Introduction

In human beings, the knee joint has the great responsibility of transmitting the ground reactions against the body weight while at the same time preserving mobility. Osteoarthritis of the knee joint is an extremely common cause of severe pain and disability in the community. There are many ways and methods by which this crippling pain in the knee can be treated. This includes use of analgesics, using a walking stick, arthrodesis, high tibial osteotomy and total knee arthroplasty. Arthroplasty is an operation to restore motion and stability to a joint and function to the muscle, ligaments and other soft tissue structures that control the joint.

Knee replacement surgery has now been established as a definite answer for painful and crippling arthritic knees. Over the last two decades total knee replacement has come a long way ever since Gunston designed the first of modern total knee prostheses.

Pain relief and the improvement of knee function are the two main reasons for total knee arthroplasty (TKA) [1, 2]. It has recently been shown that for the new generation of TKA patients, who are younger and much more demanding, function becomes increasingly important [3].

Patients expect optimal functional levels after surgery. This makes it important to supervise the recovery process carefully and monitor the outcome of surgery, and to assess functionality in daily life frequently.

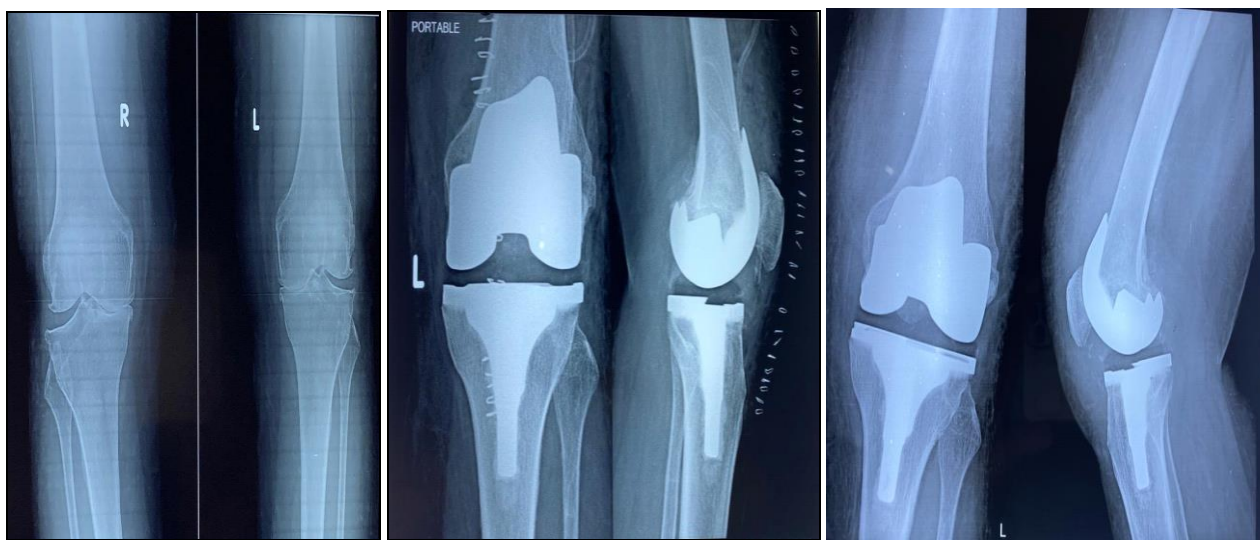
The long-term success of knee replacement is dependent upon balanced soft tissue release, precise bone cuts and perfect component placement. Irrespective of the designs used, it is imperative that the biomechanical principles are followed to achieve persistent, long lasting and reproducible results. Various immediate and long-term complications may compromise this procedure, but it still remains a great boon available to arthritic patients, and has proved to be one of the major advancements in the field of orthopaedic surgery.

Material and Methods

It is a Prospective study was conducted at Bapuji and Chigateri General Hospital attached to JJM Medical College, Davangere for a period of two years from July2018 to July 2020. Patients with primary Osteoarthritis of the knee joint, undergoing TKA were included in the study. Patients with less than 6 months follow up and patients lost to follow up were excluded from the study.

Surgical Technique

All cases in our study were operated under combined spinal and epidural anaesthesia. An indwelling epidural catheter was left insitu in all the patients postoperatively for 48 hrs for post operative analgesia. All cases were performed under tourniquet control. The standard surgical technique employed was the same in all patients which included a midline skin incision and a medial parapatellar approach, facilitating lateral dislocation of the patella. A lateral parapatellar approach was used for the lone valgus knee in our study. Osteophytes, cruciate ligaments and menisci were excised. Ligament balancing was performed prior to bone resection by release of the contracted soft tissues on the concave side of any fixed angular deformity. Flexion contractures required a posterior capsular release. The bone cuts were performed using the provided standard jigs and cutting blocks in the order of tibial cut at 90 degrees to the long axis and less than 5 degree of posterior sloping and sizing, distal femoral cut at 5 degrees valgus to the anatomical axis and perpendicularly in the saggital plane, anterior – posterior and chamfer cuts, femoral notch cut and peg holes, tibial notch cut, trial reduction and final seating, and final component fixation with cement. Patelloplasty was done in all the knees. This was followed by closure with a drain left insitu.



PRE-OP Picture

Immediate Post-Op Picture

1 Year Follow UP



Clinical Pictures at Final Follow Up

Result

A total of 30 knee replacements performed in 22 patients were included in the study. Age range of the patients in our study was from 46 yrs to 74 yrs with an average age of 62.4 yrs at the time of surgery. There were 17 females and 5 males in our study. 28 knees were in varus ranging from 5 degrees to 35 degrees with an average of 11.08 degrees. 2 knee had a valgus deformity of 20 degrees. 11 knees with varus deformities had flexion contractures ranging from 5 to 20 degrees with an average of 14 degrees. Preoperative range of motion ranged from 60 to 120 degrees with an average of 86.4 degrees. 12 Patients had unilateral total knee replacements. 6 patients underwent simultaneous bilateral total knee replacements in a single stage. 3 patients had staged bilateral total knee replacements.

Pain: Of the 30 knees (22 patients), 22 Knees (73.33%) were completely pain free at final follow up, 6 knees (20%) had mild (or) occasional vague pain, 2 knee (6.66%) had pain for climbing stairs only.

Range of motion: Average Pre op ROM was 86.4 degrees which improved to 99.6 degrees. Best recorded ROM was 120 degrees. 16 knees had preoperative ROM < 90 degrees with an average of 74.6 degrees. This improved to an average of 97.6 degrees at final follow up. There were 14 knees with preoperative ROM > 90 degrees with an average of 98.3 degrees. This improved to an average of 101.6 degrees at final follow up. 2 patients (3 knees) developed stiffness and decreased ROM postoperatively. They underwent manipulation under anesthesia at 2 ½ months post operatively followed by aggressive mobilisation to improve their ROM. All the 3 knees had 90 degrees of flexion at final follow up.

Fixed flexion contracture: There were fixed flexion contractures in 11 knees, ranging from 5 to 20 degrees (average of 14 degrees) preoperatively which was completely corrected in all the knees postoperatively.

Stability: All the 30 knees were stable anteroposteriorly both pre & post operatively. 4 knees were unstable mediolaterally which was corrected post operatively.

Alignment: Varus deformity was most commonly encountered in the knees in our study. 28 knees had varus deformity ranging from 5 to 35 degrees (avg 11.08 Degrees). 2 knee had valgus deformity of 20 degrees. All the knees were correctable to an average postoperative valgus of 4.4 degrees.

Knee society clinical score: According to knee society clinical scoring system (Insall JN 1989) [10], the average score for all the 30 knees was 35 points preoperatively. The average score was 93 points at final follow up postoperatively which is considered excellent.

26 knees (86.66 %) had excellent final scores

4 knees (13.33 %) had good final scores.

Knee Society Functional

Scores: The average preoperative functional score was 36 which improved to an average functional score of 90 postoperatively at final follow up which is considered excellent. 25 knees (83.33 %) had excellent functional scores, and 5 knees (16.66 %) had good functional scores at final follow up.

Radiological

Results

The ideal placement of the tibial component was defined as 90 + /- 5 degrees to the long axis of the tibial shaft on both the AP & lateral X-rays. The desired placement of the femoral component was 5 + /- 5 degrees of the valgus on the A-P X-rays and 90 + /- 5 degrees on lateral X-rays.

No evidence of malalignment (or) loosening in the femoral and tibial components was noted in our study.

Complications: Post operative stiffness with decreased range of motion was noted in 3 knees in our study. All the 3 knees had to be manipulated under general anaesthesia to improve the ROM. All the 3 knees had 90 degrees flexion at final follow up. Mild (or) Occasional vague anterior knee pain was noted in 6 knees. 2 Knee had mild pain for climbing stairs only. Pain in none of these knees was disabling. Overall 22 knees (73.33%) were completely pain free at final follow up.

Discussion

The success of total knee arthroplasty depends on the relief of pain, an adequate range of motion, durable function and an absence of complications. The average age of patients in our study at surgery was 62.4 yrs. The average age at surgery was 63 yrs in a study by Jauregui JJ *et al.* (2015) [5] and was 71 yrs in a study by Joshi and Gill *et al.* [6]

The average preoperative knee society clinical score was 35 which improved to 93 at final follow up. 22 knees (73.33 %) were completely pain free at final follow up and 26 knees (86.66 %) were rated excellent as per the knee society clinical score. Joshi and Gill *et al.* [6] in their study found 87 % of their patients were pain free and 91 % were rated excellent as per the knee society score.

The average gain in range of movement was 13.2 degrees. Patients with a preoperative range of movement > 90 degrees, gained on an average 3.3 degrees, and patients with a preoperative range of movement < 90 degrees gained an average of 23 degrees. In study conducted by Polascik BW *et al.* [7] at 2 years, controls had a significantly higher flexion range than cases (118o vs. 80o, $p < 0.0001$, cases had a significantly greater improvement in the flexion range at 2 years postoperatively (70o vs. 3o, $p < 0.0001$).

In our study varus malalignment was the commonest. The average preoperative Varus was 11.08 degrees. In our study all the knees were correctable to valgus with an average postoperative valgus of 4.4 degrees. The ideal alignment is 7 + /- 2 degrees of valgus. In the study LIN SY *et al.* [8] The number of outliers for all three radiological parameters of mechanical axis, frontal femoral component alignment and frontal tibial component alignment was significantly lower in the NA-QS (navigational assistance-Quadriceps-sparing) group than in the QS group ($p = 0.008$), but no outlier was found in the MP (mini-medial parapatellar) group.

All patients showed a good improvement in their walking and stair climbing ability. The mean preoperative functional score was 36 which improved to 90 at final follow up. In our study 8 patients complained of anterior knee pain at final follow up. In 6 (20%) Knees, pain was only occasional and mild. In 2 (6.66%) knee anterior knee pain was seen for climbing stairs only. Pain in none of these cases was disabling. Patella was not resurfaced in any of these knees. Anterior knee pain was reported in 29 % of their patients who underwent total knee arthroplasty without patellar resurfacing in a study by Picetti *et al.* [9].

Postoperative stiffness was noted in 3 knees. All these 3 knees underwent manipulation under anaesthesia to improve the range of motion. All of these knees had 90 degrees of flexion at final follow up. There is ambiguity in the literature concerning the definition of stiffness after total knee arthroplasty. Nicholls and Dorr *et al.* [10] defined stiffness as a flexion contracture of > 20 degrees or a total range of motion < 45 degrees. Kim, Nelson defined stiffness after total knee arthroplasty as a flexion contracture \geq 15 degrees and/ or < 75 degrees of flexion. They reported 1.3% prevalence of this complication in their study. Limited preoperative range of motion, biological predisposition, intra operative technical problems, poor patient motivation, and inadequate post operative rehabilitation have been stated as the possible causes for this complication. Of the various treatment options mentioned, manipulation under anaesthesia is generally the initial option, which is effective when performed within 6 to 12 weeks after a primary total knee arthroplasty.

6 patients in our study underwent simultaneous bilateral total knee arthroplasty. No perioperative complications were encountered in any of these patients. In the study conducted by Eric R BOHM *et al.* [11] concluded that there is important differences between outcomes of simultaneous bilateral TKR and staged bilateral TKA, with simultaneous bilateral TKA having a higher frequency of blood transfusion, a lower median hospital length of stay, a higher proportion of discharge to a rehabilitation facility, a lower 90-day risk of knee infection, and higher 90-day risk of cardiac complication. Simultaneous bilateral TKA patients appear to have similar rates of in-hospital mortality compared to patients undergoing unilateral TKA, but a lower risk of revision at 3 years.

Conclusion

This is a study with a short term follow up ranging from 6 months to 26 months. Functional results have been good irrespective of the severity of the preoperative deformities. Patient satisfaction in terms of pain relief, and improvement in walking and stair climbing ability is good following total knee arthroplasty for osteoarthritis. Total knee arthroplasty in the short term relieves pain, improves stability, functional ability and corrects deformities. A longer term follow up is required to assess whether the excellent short term results are sustainable in the long term.

Reference

- Ritter MA, Wing JT, Berend ME, Davis KE, Meding JB. The clinical effect of gender on outcome of total knee arthroplasty. *J Arthroplasty* 2008; 23(3):331-6.
- Börjesson M, Weidenhielm L, Mattsson E, Olsson E. Gait and clinical measurements in patients with knee osteoarthritis after surgery: a prospective 5-year follow-up study. *Knee* 2005; 12:121-7.
- Nilsdotter AK, Toksvig-Larsen S, Roos EM. Knee arthroplasty: Are patients' expectations fulfilled? *Acta Orthop* 2009; 80(1):55-61.
- Insall JN, Dorr L, Scott RD. Rationale of the Knee Society Clinical rating system. *Clin Orthop* 1989b; 248:13
- Jauregui JJ *et al.*, Long-Term Survivorship and Clinical Outcomes Following Total Knee Arthroplasty, *J Arthroplasty* 2015.
- Joshi A, Gill G. Total Knee Arthroplasty In Osteoarthritis: Long term results of. 943 knees: *JBJS (Br)*, 2004; 86-B(Supplement III):239.
- Polascik BW, Abd Razak HR, Chong HC, Lo NN, Yeo SJ. Acceptable functional outcomes and patient satisfaction following total knee arthroplasty in Asians with severe knee stiffness: a matched analysis. *Clinics in orthopedic surgery* 2018; 10(3):337.
- Lin SY, Chen CH, Fu YC, Huang PJ, Lu CC, Su JY, *et al.* Comparison of the clinical and radiological outcomes of three minimally invasive techniques for total knee replacement at two years. *The bone & joint journal* 2013;95(7):906-10
- Picetti GD, McGann WA, Welch RB. The patellofemoral joint in total knee arthroplasty without patellar resurfacing *JBJS* 1990;72A:1379.
- Kim J, Nelson CL, Lotke PA. Stiffness after total knee arthroplasty: prevalence of the complication and outcomes of revision. *JBJS* 2004;86(7):1479-84.
- Bohm ER, Molodianovitch K, Dragan A, Zhu N, Webster G, Masri B *et al.* Outcomes of unilateral and bilateral total knee arthroplasty in 238,373 patients. *Acta orthopaedica* 2016;87(sup1):24-30.