Early Results of Total Condylar Knee Arthroplasty using Indian-designed Prostheses

Kuldip R Salgotra, Sarabjeet Kohli, Nilesh Vishwakarma, Shaival Chavan

ABSTRACT

The present study was undertaken to evaluate the results of 50 total knee replacements performed at Military Hospital Kirkee, Pune, India, using Indian-manufactured prostheses, from November 2001 to November 2005. The study group consisted of 18 males and 28 females in the mean age of 63 years for osteoarthritis and 48 years for rheumatoid arthritis (RA): 41 knees of osteoarthritis and RA in 9 knees. The follow-up period was 6 months to 2 years, with a mean of 14 months. Good correction of deformities was achieved for all the knees. Postoperatively, there was improvement in Knee Society Score by 69 points for osteoarthritic knees and 65 points for rheumatoid knees. Excellent results were achieved in 88% of the cases. The results are comparable with those following use of far costlier imported prostheses.

Keywords: Osteoarthritis, Total condylar knee, Total knee replacement.

INTRODUCTION

Advanced osteoarthritis (OA) and rheumatoid arthritis (RA) result in painful, deformed knees, thus compromising quality of life in these patients. Most of them cannot perform activities of daily living. Total knee replacement is a very rewarding surgery and has transformed the lives of many patients crippled with pain due to osteoarthritis, RA, or traumatic arthritis of the knee joint. First arthroplasty was performed by Gluck in as early as 1890 using ivory prosthesis in hip and knee. Hinge knee prosthesis was introduced in 1957 by Walldius. Due to poor results, Gunston introduced his polycentric knee prosthesis in 1957 by Walldius. Due to poor results, Gunston introduced his polycentric knee prosthesis. Insall et al. in 1971. Insall et al. were the first to use unconstrained total condylar prosthesis with bone cement.

• More recently, 91 to 96% success rate has been achieved over a follow-up period of 11 years by Ranawat and Boachie-Adjei.

• There is yet no ideal or universal total knee replacement prosthesis available.

• An endeavor is to produce an acceptable compromise to resurface the damaged knee joint.

• The situation in India is different in many ways. Most of the patients come with very advanced disease and majority of them are unable to afford the cost unless backed by a free treatment facility.

Most of those in lower socioeconomic strata want to squat. Aim of this article is to compare the results of the more affordable Indian-designed prostheses with costlier imported ones. In our center, we have used Indian-made prosthesis, INOR total condylar knee, which has semi-constrained and posterior cruciate sacrificing design. The range of movement achieved in postoperative period and pain-free ambulation are important parameters to assess the surgical outcome. Knee Society Score has been used in our patients to assess the outcome.

MATERIALS AND METHODS

Fifty cases of cemented total knee arthroplasty using semi-constrained, posterior cruciate sacrificing Indian-made prostheses were evaluated. These surgeries were performed between November 2001 and November 2005 in Military Hospital Kirkee, Pune, India. The study consisted of 28 females and 18 males in the mean age group 63 years for osteoarthritis and 48 years for RA. Bilateral joint replacements were done in 4 patients. There were 41 cases of advanced osteoarthritis and 9 cases of RA. Preoperative and postoperative clinical and radiological assessment was done. Standing radiographs of both knees were used to assess the deformity preoperatively and its correction postoperatively. All operations were through middle line skin incision and medical para patellar arthroplasty. All the patients were managed with INOR II prosthesis which is semi-constrained, fixed bearing prosthesis. Posterior cruciate ligament was sacrificed in all the knees.

Fixed flexion deformity was corrected by soft tissue release and excision of osteophytes. Extra distal femoral...
resection was done in 3 cases (6%) to correct the fixed flexion deformity. Medial tibial condylar reconstruction with bone grafts was required in 5 patients (10%). Patella was replaced in 36 patients (72%). Lateral retinacular release was done in 5 patients. Continuous passive motion was started after drain removal on third postoperative day in all cases except those who could not tolerate the same. This was augmented by quadriceps exercises and active knee movements by the patient. Weight bearing with the help of walker was started as soon as patient was able to do active straight leg raising, usually on 5th postoperative day.

The cases were followed up for a period of 6 months to 2 years. Postoperative results were assessed clinically and radiologically using Knee Society Scoring System. These results were compared with various other results published in journals in India and abroad.

RESULTS

The present study comprises 50 total knee arthroplasties in 46 patients. Four (8%) patients underwent bilateral joint replacement. Nine (18%) patients had RA affecting knee joint, while 41 (82%) had osteoarthritis. There were 28 females and 18 males. Table 1 shows the distribution of age in the study group. The etiology of the group was tabulated in Table 2.

The average age of patients was 63 years for advanced osteoarthritis and 48 years for RA, the range being 29 to 74 years. Range of movement was more than 90° in 40 (80%) knees, 80° to 90° in eight (16%) knees, and less than 80° in two (4%) knees. More than 20° fixed flexion deformity was present in six (12%) knees and extradistal femoral resection to correct the same was required in five (10%) knees (Table 3). In others, deformity correction was achieved by soft tissue release and excision of osteophytes posteriorly.

Varus deformity of more than 20° was present in four (8%) knees as summarized in Table 4. All had significant lateral ligament laxity (>15°). Thicker tibial inserts were used in all patients [11 mm in 1 (2%) and 14 mm in 3 (6%) cases]. Three patients required reconstruction of medial condyle using bone graft from distal femoral or proximal tibial cuts.

The patients were followed up for 6 months to 2 years with a mean follow-up of 14 months. X-rays were taken preoperatively and postoperatively and at follow-up, as shown in Figures 1 to 3. Two patients (4%) complained of postoperative pain on ambulation. This was because of instability and local swelling. Two patients (4%) had

![Fig. 1: Preoperative X-ray of knees](image1)

![Fig. 2: Immediate postoperative X-ray](image2)
mild pain on climbing stairs after a follow-up of 2 years. Residual fixed flexion deformity of up to 10° was seen in two knees (4%) and this had corrected after 1 year of surgery.\(^6,7\) Superficial wound infection was present in four knees which healed with dressings. Manipulation under epidural anesthesia was required for improving the range of motion in 2 patients. As per the clinical Knee Society Scoring System, 44 knees (88%) had excellent results, 4 knees (08%) had good results, 1 knee (2%) had fair result, and 1 knee (2%) had poor result. The fair result was in a grossly obese lady with bilateral knee replacement who is presently ambulant with a walking stick. The result was in a rheumatoid patient who developed analgesic nephropathy.

There was improvement in Knee Society Score by an average of 65 points in rheumatoid knees, and by an average of 69 points in osteoarthritic knees. Minimum postoperative range of knee was 40° and maximum was 96°, the average being 90°. Postoperative functional score of 75 to 90 was achieved by 82% of patients with an average functional score of 80 in the series. The knee society category and clinical score distribution are summarized in Tables 5 and 6 respectively.

**DISCUSSION**

The results obtained in this study are comparable with other study groups in India using other fixed bearing prosthesis.\(^4,5\) Postoperatively, no pain was present in 96% of patients in follow-up. This agrees with Chaudhary et al\(^3\) series in which pain relief was present in 90% patients. Thirty one patients (62%) were of poor socioeconomic strata and 3 (06%) despite being cautioned were squatting while working or while passing stools. They preferred good range of movement to some amount of instability.\(^6\) The average flexion in our study is 90.4°. Reddi et al\(^7\) series on condylar gives an average flexion of 94.24°. Dhaon et al\(^8\) have achieved an average flexion of 96° in varus knees and 97.4° in valgus knees.

In Dhaon et al\(^8\) study, the postoperative alignment was 5.3° valgus. In our series the postoperative alignment achieved is 5.2° valgus; 48 (96%) had varus deformity of knee with only two knees (04%) having a valgus deformity in a polyarthritis patient with RA. Good correction was achieved in all. Residual fixed flexion deformity of up to 10° was seen in two knees (4%) and this had corrected after 1 year of surgery.\(^9,10\)

In this study, average improvement in hospital for special surgery score for rheumatoid knee was 34. Patellar resurfacing is also a matter of controversy and in this study replacement of all patellae was done to prevent postoperative anterior knee pain. Most of the studies have shown no difference in results with or without replacement of patella.\(^11,12\) Though the follow-up of period is too short to comment on the longevity of the prosthesis, there is no evidence of implant loosening, wear and tear of polythene, or wound infection. Superficial wound gaping was seen in four knees, of which two were in rheumatoid patients. Both these patients had been on long-term steroids and methotrexate which was stopped 6 weeks prior to surgery. In all these cases, the wound infection healed with local dressings.

The results of this study indicate that the use of Indian prosthesis, which are cheaper alternatives to the costly imported ones, can give good results if the basic surgical technique is correct and bio-mechanics are adhered to. Fixed bearing, posterior cruciate ligament sacrificing prosthesis gave satisfactory results in a population ranging from low socioeconomic strata to upper middle class group.

**CONCLUSION**

Total condylar knee replacement with INOR Indian-designed knee is suitable to provide pain-free, stable, and...
mobile knee joint to patients suffering from advanced osteoarthritis and RA who cannot afford costlier imported prostheses.

REFERENCES


