

Early Functional Outcome of Total Knee Arthroplasty

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ABSTRACT

Objective: To evaluate the early results of patients in a single institution who underwent total knee arthroplasty using an implant system. **Methods:** We retrospectively reviewed 76 total knee replacements using the Genesis II prosthesis (Smith and Nephew, Memphis) in 60 patients (16 were bilateral cases) performed between February 2005 and February 2008. Patient related outcomes and clinical evaluations were done by an independent observer. Knee function and patient satisfaction were evaluated using the American Knee Society (ASK) score and the Western Ontario and Mac Master University Osteoarthritis Index (WOMAC). **Results:** The mean age of the patients at the time of operation was 63.5 years. The mean follow up period was 1 year 5 months. At the final follow up, the mean Knee Society Knee Score was 87.9 with 77.3% (58 knees) rated excellent, 21.3% (16 knees) rated good and 1.3% (1 knee) rated fair; none were rated poor. The mean Function Score was 87.1 with 64% (48 knees) rated excellent, 29.3% (22 knees) rated good, 6.7% (5 knees) rated fair, no knee was rated poor. The mean WOMAC Score was 94.4 (standard deviation 6.59). **Conclusion:** Most patients treated for knee osteoarthritis with total knee replacement showed high rates of excellence and good early functional outcomes.

Key Words:

Total Knee Arthroplasty, High Flexion Knee

INTRODUCTION

Total knee arthroplasty (TKA) is one of the most commonly performed orthopaedic procedures. Indications for this procedure are knee joint failure secondary to osteoarthritis, rheumatoid arthritis, juvenile rheumatoid arthritis, osteonecrosis and other types of inflammatory arthritis¹. In 2004, approximately 43 million individuals in the United States suffered from arthritis². This condition becomes increasingly common with advancing age. Arthritis of the knee results in loss of functional status and impacts upon independence and quality of life. The high prevalence of arthritis in the population is confirmed by the dollar amounts

spent on treatment. In the United States, an estimated US\$95 billion per year is spent on the treatment of arthritis². This figure does not include the additional costs due to lost job productivity. Treatment options are primarily designed to relieve pain and improve functional status. The primary treatment for patients with end stage arthritis of the knee is total knee arthroplasty (TKA) wherein the knee joint is replaced with a prosthesis. Previous reports have suggested that total knee arthroplasty improves functional status and relieves pain with relatively low perioperative morbidity³.

We conducted this study to evaluate the early results of patients in our institution who underwent total knee arthroplasty using a single type of implant system.

MATERIALS AND METHODS

We retrospectively reviewed 76 cases in 60 patients (16 bilateral cases) of total knee replacement using the Genesis II prosthesis (Smith and Nephew, Memphis) performed by a senior consultant between February 2005 and February 2008. All the patients received pre-emptive pain relief with a selective COX-2 inhibitor. They were administered combined spinal epidural anaesthesia. Tourniquets were used in all patients throughout the surgery. The surgeon used a midline incision with a medial para-patellar approach for all the cases. Intra-medullary jigs were used on the tibia and the femur to determine the alignment. Bone cuts were made with the aid of the Genesis II MIS instrumentation system. Epidural was continued for 48 hours. Patients were also required to wear thrombo-embolic deterrent stockings for 2 weeks. Those with contraindication to anticoagulants were kept on a low molecular weight heparin until they were ambulatory.

Patient related outcomes and clinical evaluations were made by an independent observer. The American Knee Society score (AKS)⁵ and the Western Ontario and Mac Master University score (WOMAC)^{6,7,8} were used to rate knee function and to determine satisfaction level of each patient. These scales typically cover aspects of pain and function. They are intended to provide a score of 0 to 100, where a

higher score implies a better outcome. The American Knee Society score is divided into Knee Score and Functional Score and is completed by clinicians, while the WOMAC is designed to be completed by the patient. The Knee Score considers a score of less than 60 as poor, 60-69 as fair, 70-84 as good and 85-100 as excellent.

RESULTS

A total of 60 patients involving 76 knees were included in the study. All were implanted with the Genesis II posterior cruciate ligament sacrificing prosthesis; 5 knees had oxidized zirconium implants whilst the rest had cobalt chromium implants. The primary pathology for all knees was osteoarthritis. Of the 60 patients that were recruited, 88.3% or 53 patients were female and 11.7% or 7 patients were male. The mean age of patients at the time of surgery was 63.5 years (range, 46-79 years). 46.7% were Chinese (28 patients), 41.7% were Malays (25 patients) and 11.7% Indian (7 patients). Forty-four patients had unilateral total knee replacement whilst 16 patients had bilateral total knee replacement done. The mean follow up period was 531 days or 1 year 5 months.

The mean American Knee Society Knee score was 87.9 (standard deviation 5.7) with 77.3% (58 knees) rated excellent, 21.3% (16 knees) rated good, 1.3% (1 knee) rated fair, and none rated poor. The ASK scores ranged from 69 to 93. The mean Function Score was 87.1 (standard deviation 13.3) with 64% (48 knees) rated excellent, 29.3% (22 knees) rated good, 6.7% (5 knees) rated fair, and none rated poor. The Function Scores ranged from 55 to 100. The mean WOMAC score was 94.4 (standard deviation 6.59). The WOMAC scores ranged from 73.5 to 100. In this retrospective study we did not have preoperative knee scores to compare with the final knee scores.

There was one case of infected TKA in this study, (1.3% of cases reviewed). This patient required removal of implant and cement spacer placement. Subsequently, revision TKR was performed with a similar implant and resulted in a favourable outcome. There was no evidence of polyethylene wear or osteolysis at the time of review. There was no case of aseptic loosening or anterior knee pain in this study.

DISCUSSION

TKA can provide excellent pain relief and restoration of function for patients. The success of the procedure is related to implant survival. This study showed that most patients achieved good to excellent early results with the treatment. The mean Knee Society Knee score was 87.9 with 77.3% (58 knees) rated excellent, 21.3% (16 knees) rated good, 1.3% (1 knee) rated fair and none rated poor. The mean Function Score was 87.1 with 64% (48 knees) rated excellent, 29.3% (22 knees) rated good, 6.7% (5 knees) rated fair and no knee rated poor.

Our patient outcomes compared favourably to another study reporting early results of 48 patients with 60 knees treated with posterior stabilized TKR where the mean post operative Knee Score was 85 (70-100) and the mean Functional Score was 70 (55-100)⁹. The mean WOMAC score of our study was 94.4, here again, showing better results than another study on Kinemax total knee replacement surgery performed on 407 patients involving 523 knees where the mean WOMAC score of 79.0¹⁰.

The introduction of computer-assisted surgery using a navigation system and minimally invasive surgery techniques reduces the trauma and recovery time¹¹. As a result, accelerated rehabilitation can be initiated and functional ability can be improved. The use of a navigation system is expected to lead to greater consistency of clinical results in addition to minimizing problems such as alignment error and bony preparation error.

CONCLUSION

The early result of the TKR was excellent or good in most patients based on Knee Society Knee and Function scores and the WOMAC score. Most of the patients were functionally independent, had no knee pain and were satisfied with their outcomes.

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