

Analysis of the Outcome of Total Knee Replacement in Obese and Overweight Patients with Varus and Valgus Deformities

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Abstract

Introduction: The study was done with the objective to evaluate clinical and functional outcomes of total knee replacement in obese patients in terms of relief of pain and range of movements.

Materials and Methods: The study was done during the period between 1998 and 2014. All the patients' data were maintained and recorded. The data were obtained from the medical records department of both hospitals. Each patient was followed up for 6 months - 8 years.

Results: A total of 74 patients were included in the study with the mean of age of 62 years among obese and non-obese patients, the follow-up period of 6 months. The outcomes of the total knee replacement surgeries among obese patients were excellently well similar to other patients.

Conclusion: The study has concluded that the both clinical and functional outcomes were similar in both obese and non-obese patients who underwent total knee replacement.

Key words: Obese, Total knee replacement, Valgus deformity, Varus deformity

INTRODUCTION

Obese patients are commonly suffering from cardiac problems, joint problems, and diabetic related problems. Many patients are taking care for diabetic and cardiac health problems in early stage itself, but for joint problems, they are reporting at late stages with complications such as deformities. Similarly, increased deformities and the most common malalignment problems are encountered during total knee replacements. In obesity, the knee joint is subjected to major stress than any other joints. Hence, in obese patients, total knee replacements may pose many biomechanical problems. Total knee replacements are the only treatment for obese patients with arthritic knee with significant pain

and deformity. Various procedures such as osteotomy, synovectomy, and patellectomy have narrow indications and limited prognosis in relieving pain. Obese patients are prone for infections, either or recurrent infections.

Aims and Objectives

The present study evaluates clinical and functional outcomes of total knee replacement in obese patients in terms of relief of pain and range of movements.

MATERIALS AND METHODS

The study was done during the period between 1998 and 2014. All the patients' data were maintained and recorded. The data were obtained from the medical records department of both hospitals. Each patient was followed up for a period of 6 months - 8 years.

Inclusion and Exclusion Criteria

Pre-operative planning

Gait analysis revealed that the deformities such as rotational or angular were selected for surgery. The amount deformity

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along with passive correction attained is measured. Unusual angulation of tibia and femur is noted, whether varus or valgus deformities are fixed, or flexible is assessed. Pseudolaxity due to loss of medial joint space must be differentiated from fixed varus knee contractures of the hip and knee, foot deformity, and vascular status of the limb was assessed.

X-rays

1. AP weight bearing
Standing X-rays of the limb were taken to measure anatomical and mechanical axis. If the widening is not taken into consideration, malalignment may be overcorrected.
2. Lateral view
3. Axial view: To look for patellofemoral arthritis and patellar instability
4. Varus/valgus stress view to assess the correct ability and residual contractures and bone loss
5. Long leg AP view: To assess the tibiofemoral angle extra articular deformities and weight bearing axis.

Operative Procedure

Under general anesthesia or regional anesthesia, patient was placed on supine position. Under tourniquet control through anterior midline, incision knee was approached in all cases. For 62 patients, we used Freeman–Samuelson type of prosthesis. For 12 patients, Johnson and Johnson prosthesis was used. Cementation was used in all cases. As it was required for correction deformity in the entire cases, posterior cruciate was sacrificed. Varus deformity was managed by the following methods. Excision of medial aspect osteophytes and by release of sleeve of soft tissue consisting of periosteum, insertion of pes anserinus, deep and superficial layers of medial capsule. Valgus deformity was managed by relax of lateral capsule, lateral retinaculum, lateral femoral periosteum, distal iliotibial band, and popliteus tendon (Figure 1). Flexion deformity was corrected by removal posterior osteophytes, relax of capsule from posterior tibia and femur, and antibiotics was given 5-7 days.

Post-operative Period

In post-operative period, for obese patients, the limb was immobilized in a tube slab for 3-4 days. In some of the patients, it was prolonged for even 7-8 days as soft tissue release was done. Sutures were removed on the 12th day. Gradual to full weight bearing was started as tolerated by the patients.

RESULTS

A total of 74 patients were selected for the study, of which 64 were with osteoarthritis and 8 with rheumatoid arthritis,

and the remaining 2 were HTO. Similarly, 68 cases were unilateral, and 3 were bilateral. The females were 58, and the remaining 16 were males. The mean age of females was 61.75, and the mean age of males was 67 years. Mean weight of females and males were 66.8 and 79.8, respectively. In OA varus deformity, 42 had severe deformity and 22 moderate deformities (Figure 2). Follow-up period ranges from 6 months to 8 years with the mean follow-up of 3 years, and the results were analyzed using the Knee Society Clinical Rating System.

DISCUSSION

In the normal knee, loads that are 2-4 times body weight are imposed on tibiofemoral joint, with 60% of the load passing through the medial compartment. In these obese patients, the medial compartment leads to loss of cartilage on the medial articular surface of the femur and tibia. The partial body weight has to act as a longer moment than the normal since the position of the knee places it for lateral from the center of gravity. The balancing force on the lateral side increased. The stress on the medial compartment is increased and that force is exerted through a smaller than normal surface. This increase in stress causes the degenerative process to accelerate further. The adductor movement and lateral ligament stretching given a lateral tibial thrust, and this leads to lateral rotatory subluxation of the tibia. With operations

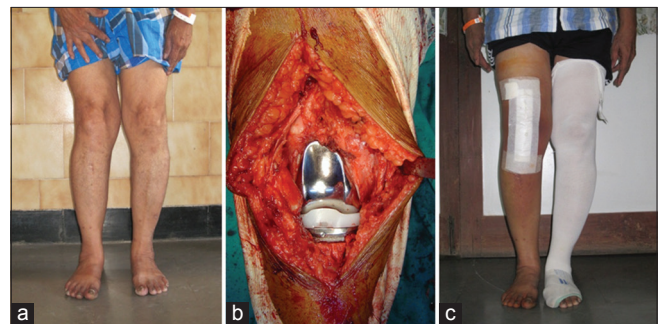


Figure 1: (a-c) Showing a male patient before and after the total knee replacement surgery

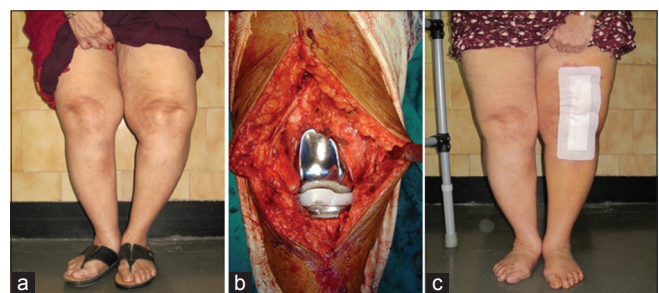


Figure 2: (a-c) Showing obese female patient underwent total knee replacement surgery

for knee arthroplasty increasing faster than those for total hip replacement, some of the British skepticism about knee surgery is clearly disappearing. Recent studies justify this change of attitude: In experienced units, the insertion of condylar prostheses in well-selected cases probably has a higher success rate than that for total hip replacement and gives rise to fewer long-term complications and failures.^{1,2} The operation's success depends on the selection of patients, choice of prosthesis, and surgical skill. Patients should be judged on their symptoms rather than their radiological signs; the correlation between the two may be poor. Provided they are fit enough for surgery patients with pain at rest, and disturbed sleep should be offered operation. Those whose pain on movement confines them to their home and garden should also be considered. The operation relieves pain in more than 95% of cases,^{2,3} with functional improvement occurring in over 90%.⁴ Patients with rheumatoid arthritis do particularly well.

CONCLUSION

This present study has concluded that obese and non-obese patients improved well as far as the clinical and functional outcome is concerned irrespective of difference and gender difference.

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