A nature friendly knee arthroplasty for prayer and meditation in Asiatic lifestyle

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Abstract

Introduction: India is a country where many religions coexist together. Prayer & meditation form an integral part of Indian lifestyle. Also 90% of India’s population lives in the rural areas. Medial compartment osteoarthritis is the most common type of arthritis in India. Total knee replacement has longer rehabilitation time, morbidity and cost. In addition, it doesn’t allow squattting and sitting cross legged. With rise in unicompartmental knee replacements for medial compartment osteoarthritis, patient’s satisfaction is much higher. Hypothesis of this paper was to investigate whether sitting cross-legged easily on floor for prayer and meditation, contributed to higher levels of patients satisfaction in unicompartmental knee replacement significantly.

Material & Methods: this retrospective study was done with study population of 36 patients of which, 33 knees of unicompartmental knee replacement (mean age 61.7) and 25 knees of total knee replacement (mean age 63.5). We used modified Oxford knee score to compare the functional outcome and Likert scale for grading the patient’s satisfaction level.

Results: study outcome after unicompartmental knee replacement was extremely satisfactory for all patients measured with modified Oxford knee score and is better than total knee replacement. The mean Oxford score for 33 knees with unicompartmental knee replacement is 47.18 and for 25 knees with total knee replacements is 46.35. But viewing by satisfaction index point of view, patients are highly satisfied with unicompartmental knee replacement because of ability to squat and sit cross-legged used for praying and meditation and other social habits.

Keywords: osteoarthritis, unicompartmental, total knee replacement, asiatic lifestyle

Introduction

Osteoarthritis is the most common form of arthritis in knee. It is a degenerative arthritis that occurs most often in people 50 years or older. Common symptoms include pain, swelling, deformity, decreased walking and exercises which affects all the systems finally affecting the life expectancy [1].

“Sitting on the floor is active sitting” – for centuries people in India sat on floors either cross-legged or in a squatting position. In yoga poses like as in “Vajrasana”, “Sukhasana”, it provides a subtle stretch to the spinal roots and nerves and keeps them healthy. You actually engage many of your muscles as opposed to when you sit on a chair. When you sit cross-legged on the floor where your heart receives the benefit of better circulation! [2].

By sitting on the floor, we strengthen the lumbar region of the body, reducing back pain and discomfort. The hips open, making our pelvis and legs more flexible. Core muscles are strengthened, and the ankles also get gently stretched. Floor sitting also helps promote mental calmness, soothes frazzled nerves and is said to aid one’s creative imagination [3].

Total knee replacement was a common choice for relief and instability correction in properly selected patients. This recommendation is often superfluous, training oriented, a hand me down from the dinner table culture of the west. It is certainly not a culture & Indian lifestyle friendly surgery.

Many studies have found higher range of motion & functional result along with increased longevity with unicompartmental knee surgery [4-8] irrespective of stage of arthritis and
involvement of the single compartment, total knee replacement is standard choice of treatment in India, squatting and sitting cross legged are common practices in India and considered as an integral part of routine lifestyle. These activities are not possible with standard design used in total knee replacement and the need to question this choice is imperative.

Availability of unicompartmental knee replacement implants offers early recovery, low cost, longer survival studies, lower complication rate, less postoperative co-morbidities and most importantly allows the return to normal activities like squatting and sitting cross legged \(^9\)\(^{11}\) this affects the satisfaction level of the patient postoperatively increasing the acceptance \(^{13}\) results of unicompartmental knee replacement are better with early return to activity, shorter rehabilitation time, less invasive procedures, higher patient satisfaction, ACL is retained providing more natural kinematics. it even allows early return to the sporting activities.

Range of movement in unicompartmental knee replacement is comparable or better than total knee replacement. With survival rates ranging from 94 to 100% at 10 years and 95% in 15 years & more than 90% at 20 years, we raise an important question of what should be the first choice of arthroplasty for unicompartmental knee affliction which is the reason more than 75% of patients undergo arthroplasty \(^{13}\). Hence unicompartmental knee replacement should be considered whenever indicated. Considering the patients satisfaction, daily activities like squatting and sitting cross-legged, floor activities social activities recreational activities can be continued after unicompartmental knee replacement. The above mentioned benefits of unicompartmental knee replacement are gaining popularity in Asian population mainly because of allowance of meditation and prayer.

**Materials and Methods**

**Study design**

This study was done in BKL Walawalkar rural hospital and research centre, a tertiary hospital. This retrospective study was done with the study populationof 37 patients of which there were 33 knees of unicompartmental knee replacement and 25 knees of total knee replacement. Minimally invasive approach was used for unicompartmental knee replacement and a standard medial parapatellar approach was used for total knee replacement.

**Inclusion criteria**

Criteria for unicompartmental knee replacement was medial compartment OA GRADE III /IV Allbach Classification \(^{14}\). Criteria for total knee replacement was severe deformities with FFD >15 degrees, Varus>15 degrees, Tricompartmental OA, bone loss deformities.

**Exclusion criteria**

Exclusion criteria was patients with spine condition with radiating pain / dermatomal conditions, any active infection, past history of DVT, past history of lower limb surgery.

With the inclusion and exclusion criteria we had 37 patients in total. The mean age of the patients undergoing unicompartmental knee replacement was 61.7 and that of patients undergoing total knee replacement was 63.5.we operated 33 knees in 19 patients undergoing unicompartmental knee replacement and 25 knees in 18 patients undergoing total knee replacement.

All patients were operated under spinal and epidural anaesthesia. Post-operative similar physiotherapy protocols were used. We used the modified oxford knee score (Appendix 1) to compare the functional outcome.

In this score there are 12 questions where each question has a grading of 0-4, 0 being the worst and 4 being the best.

Total score was 48 where

- 0-9 was considered poor
- 9 to 19 is moderate
- 20 to 39 is good
- 40 to 48 are excellent.

Post operative scores were taken 6 weeks after the surgery. We also used the Likert scale for grading the patient’s satisfaction level. The scale is as follows

5 - Extremely satisfied
4- Satisfied
3- neutral
2 - Unsatisfied
1 - Extremely unsatisfied

We have taken the consent of all the patients and ethical committee in our study group.

**Results**

Analysis is done using the SPSS software unicompartmental knee replacement paired sample statistics

|          | Mean | N  | Std Deviation | Std Error Of Mean | 95% Conf Interval Lower | 95% Conf Interval Upper |
|----------|------|----|---------------|-------------------|-------------------------|-------------------------|
| Unicondylar Knee Replacement Pre Op | 20.974 | 19 | 3.0527 | 0.7003 |
| Unicondylar Knee Replacement Post Op | 46.105 | 19 | 2.7466 | 0.6041 |

|          | Mean | N  | Std Deviation | Std Error Of Mean | 95% Conf Interval Lower | 95% Conf Interval Upper |
|----------|------|----|---------------|-------------------|-------------------------|-------------------------|
| Pre & Post | -25.1316 | 3.7914 | 0.8709 | -23.3018 | -23.3018 |

|          | Mean | N  | Std Deviation | Std Error Of Mean |
|----------|------|----|---------------|-------------------|
| Pre Op   | 21.165 | 17 | 1.8801 | 0.456 |
| Post Op  | 47.206 | 17 | 1.0164 | 0.2465 |

|          | Mean | Std Deviation | Std Error Of Mean | 95% Conf Interval Lower | 95% Conf Interval Upper |
|----------|------|---------------|-------------------|-------------------------|-------------------------|
| Pre & Post | -25.9412 | 2.157 | 0.5231 | -27.0502 | -24.8832 |

Table 1: Unicondylar knee replacement pre-operative and post-operative modified oxford knee comparison

Table 2: Unicondylar Knee Replacement Paired Samples Test

Table 3: Total Knee Replacement Paired Sample Statistics

Table 4: Total Knee Replacement Paired Samples Test

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Table 5: Group Statistics- Unicondylar Knee Replacement and Total Knee Replacement

|                          | Mean   | N   | Std Deviation | Std Error of Mean |
|--------------------------|--------|-----|---------------|-------------------|
| Unicondylar Knee Replacement | 25.1316 | 19  | 3.79635       | 0.87094           |
| Total Knee Replacement    | 25.9412 | 17  | 2.15698       | 0.52315           |

Image 1 Image 2 Post operative xray unicondylar knee replacement anteroposterior and lateral view

Chart 1: New Oxford knee Score comparison

Chart 2: Likert scale in unicondylar Knee Replacement

| Grading of Oxford Knee Score | Score | Grade  |
|------------------------------|-------|--------|
|                              | 0-19  | Poor   |
|                              | 20-29 | Moderate|
|                              | 30-39 | Good   |
|                              | 40-48 | Excellent|
Results
In our study mean age of unicondylar knee replacement patients was 61.7 and that of patients undergoing total knee replacement was 63.5. We operated 33 knees patients undergoing unicondylar knee replacement and 25 knees in 17 patients undergoing total knee replacement. Mean oxford score for total knee replacement in 17 patients is 47.18 and for unicondylar knee replacement in 19 patients is 46.35. Results suggest that there is no statistical difference between total knee replacement and unicondylar knee replacement as per the new oxford score. But there is increase in patient satisfaction by 89% as per Likart scale in unicondylar knee replacement because of sitting crossed legged and squatting.

Discussion
Osteoarthritis of the knee is one of the commonest debilitating diseases causing pain, deformity and functional disability affecting the patient’s physical, mental as well as the social aspects of patient’s life. Results of unicondylar knee replacement have been very promising. Wear rate of fixed bearing unicondylar knee replacement is significantly lower than the fixed total knee replacement under identical kinematic conditions reported in the recent studies by C L Brockett [5] along with results unicondylar knee replacement offers early return to activity, shorter hospital stay return to sporting activities [15-20], less invasive and maintains natural kinematics of knee joint [6], with advances in implants of unicondylar knee replacement there is an increase in the survival rate, 94 to 100% at 10 years and around 95% in 15 years [13, 21, 22]. Along with that unicondylar knee replacement allows squatting and sitting cross-legged which is associated with an increased level of satisfaction in our study population.
it also opens the traditional way to prayer & meditation in the Indian cultural setup.

**Conclusion**

In our study, we received excellent results with both unicompartmental knee replacement and total knee replacement in terms of new Oxford knee score. These results were achieved in a short period of time through short term analysis. We also conclude that performing the unicompartmental knee arthroplasty on patients allowed them to return to their normal activities including the squatting and sitting cross-legged positions used in social, religious, household and farming activities.

In our study 89% patients were satisfied because of above-mentioned advantages of unicompartmental knee replacement. Hence unicompartmental knee replacement should be considered whenever indicated in the Indian rural population demanding inclusion of squatting and sitting cross-legged positions in their daily activities and for those who wish to pray & meditate traditionally.

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