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**Pavankumar Kohli**  
Professor, Department of  
Orthopaedics BKL Walavalkar  
Rural Hospital and Research  
Center, Derwan, Chiplun,  
Ratnagiri, Maharashtra, India

**Sushant Chavan**  
Fellow In Joint Replacement,  
Department Of Orthopaedics  
BKL Walavalkar Rural Hospital  
And Research Center, Derwan,  
Chiplun, Ratnagiri,  
Maharashtra, India

**Ankush Nawale**  
Junior Resident, Department of  
Orthopaedics BKL Walavalkar  
Rural Hospital and Research  
Center, Derwan, Chiplun,  
Ratnagiri, Maharashtra, India

**Siddharth Hardikar**  
Junior Resident, Department of  
Orthopaedics BKL Walavalkar  
Rural Hospital and Research  
Center, Derwan, Chiplun,  
Ratnagiri, Maharashtra, India

**Sunil Nadkarni**  
Professor Emeritus and Trustee,  
Department Of Orthopaedics  
BKL Walavalkar Rural Hospital  
and Research Center, Derwan,  
Chiplun, Ratnagiri,  
Maharashtra, India

**Correspondence**  
**Sushant Chavan**  
Fellow in joint replacement,  
Department of orthopaedics  
BKL Walavalkar Rural Hospital  
and Research Center, Derwan,  
Chiplun, Ratnagiri,  
Maharashtra, India

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

**Pavankumar Kohli, Sushant Chavan, Ankush Nawale, Siddharth Hardikar and Sunil Nadkarni**

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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 squatting and sitting cross legged. With rise in unicondylar 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 unicondylar knee replacement significantly.

**Material & Methods:** this retrospective study was done with study population of 36 patients of which, 33 knees of unicondylar 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 unicondylar 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 unicondylar 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 unicondylar knee replacement because of ability to squat and sit cross-legged used for praying and meditation and other social habits.

**Keywords:** osteoarthritis, unicondylar, 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 unicondylar 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 unicondylar 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 post operatively increasing the acceptance [12] results of unicondylar 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 unicondylar 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 unicondylar knee affliction which is the reason more than 75% of patients undergo arthroplasty [13].

Hence unicondylar 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 unicondylar knee replacement. The above mentioned benefits of unicondylar 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 population of 37 patients of which there were 33 knees of unicondylar knee replacement and 25 knees of total knee replacement. Minimally invasive approach was used for unicondylar knee replacement and a standard medial parapatellar approach was used for total knee replacement.

**Inclusion criteria**

Criteria for unicondylar 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, Tricompartamental 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 unicondylar knee replacement was 61.7 and that of patients undergoing total knee replacement was 63.5. we operated 33 knees in 19 patients undergoing unicondylar 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 unicondylar knee replacement paired sample statistics

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

	Mean	N	Std Deviation	Std Error Of Mean
Unicondylar Knee Replacement Pre Op	20.974	19	3.0527	0.7003
Unicondylar Knee Replacement Post Op	46.105	19	2.7466	0.6041

**Table 2:** Unicondylar Knee Replacement Paired Samples Test

Unicondylar Knee Replacement	Mean	Std Deviation	Std Error Of Mean	95% Conf	
				Interval Lower	Interval Upper
Pre & Post	-25.1316	3.7914	0.8709	-23.3018	-23.3018

**Table 3:** Total Knee Replacement Paired Sample Statistics

Total Knee Replacement	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

**Table 4:** Total Knee Replacement Paired Samples Test

Total Knee Replacement	Mean	Std Deviation	Std Error of Mean	95% Conf	
				Interval Lower	Interval Upper
Pre & Post	-25.9412	2.157	0.5231	-27.0502	-24.8832

**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

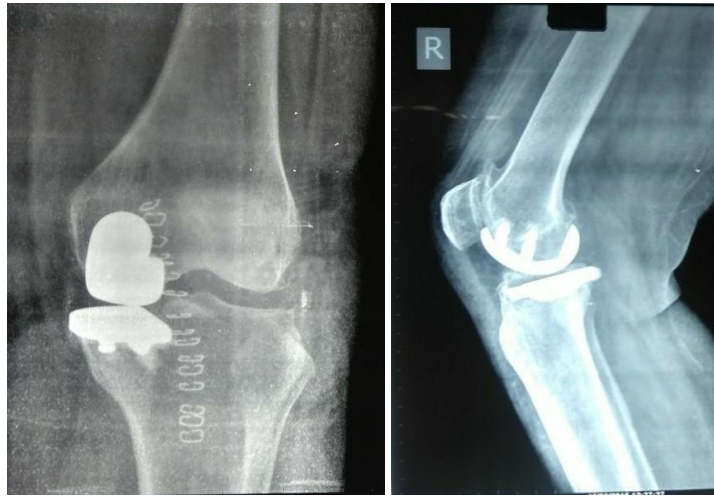
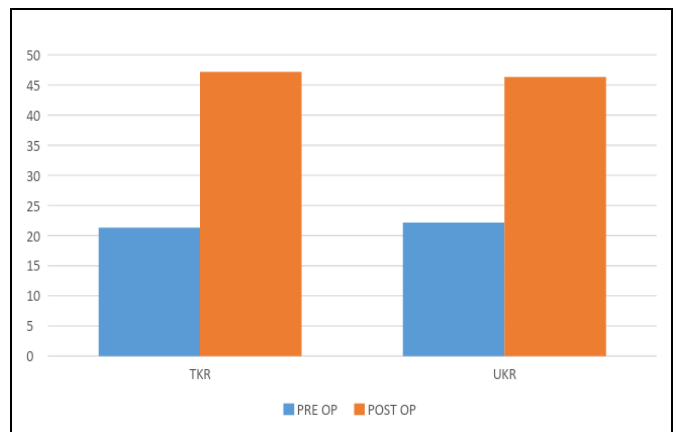


Image 1 Image 2 Post operative xray unicondylar knee replacement anteroposterior and lateral view



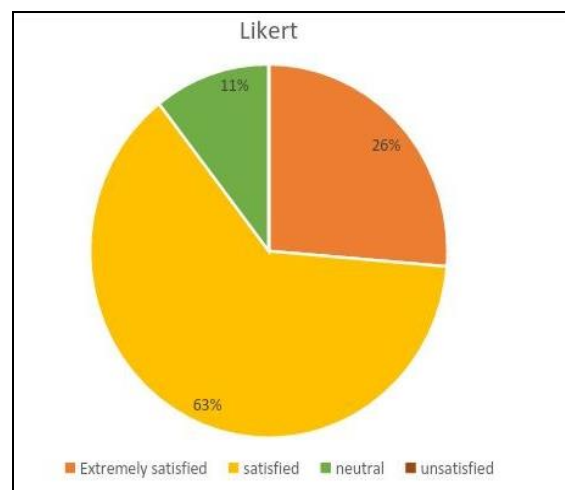
Image 3 patient sitting cross-legged



**Chart 1:** New Oxford knee Score comparison



Image 4 patient sitting cross-legged



**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

**NEW OXFORD KNEE SCORE QUESTIONNAIRE**

Please answer the following 12 questions. Choose only one answer per question. The value for each answer is indicated to the right of the answer. Total up all of your answers to obtain a total score out of 48 points. Please only consider how you have been getting on during the past four weeks

Name:			
Date:			
Left or right Knee?			

<p><b>1. How would you describe the pain you have usually from your knee?</b></p> <p style="text-align: right;">None – 4 Very mild – 3 Mild – 2 Mild moderate – 1 Severe – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>8. Have you been able to do your own household shopping on your own?</b></p> <p style="text-align: right;">Yes, easily – 4 With little difficulty – 3 With moderate difficulty – 2 With extreme difficulty – 1 No, impossible – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>
<p><b>2. Have you had any trouble with washing and drying yourself all over because of your knee?</b></p> <p style="text-align: right;">No trouble at all – 4 Very little trouble – 3 Moderate trouble – 2 Extreme difficulty – 1 Impossible to do – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>9. For how long have you been able to walk before the pain from your knee became severe (with or without a stick)?</b></p> <p style="text-align: right;">No pain, even after more than 30 minutes – 4 16-30 minutes – 3 5-15 minutes – 2 Around the house only – 1 Unable to walk at all – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>
<p><b>3. Have you had any trouble getting in and out of a car or using public transport because of your knee?</b></p> <p style="text-align: right;">No trouble at all – 4 Very little trouble – 3 Moderate trouble – 2 Extreme difficulty – 1 Impossible to do – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>10. Have you been able to walk down a flight of stairs</b></p> <p style="text-align: right;">Yes, easily – 4 With little difficulty – 3 With moderate difficulty – 2 With extreme difficulty – 1 No, impossible – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>
<p><b>4. If you were to kneel down could you stand up afterwards?</b></p> <p style="text-align: right;">Yes, easily – 4 With little difficulty – 3 With moderate difficulty – 2 With extreme difficulty – 1 No, impossible – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>11. After a meal (sat at a table) how painful has it been for you to stand up from a chair because of your knee?</b></p> <p style="text-align: right;">Not at all painful – 4 Slightly painful – 3 Moderately painful – 2 Very painful – 1 Unbearable – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>
<p><b>5. Have you been limping when walking because of your knee?</b></p> <p style="text-align: right;">Rarely/never – 4 Sometimes or just at first – 3 Often, not just at first – 2 Most of the time – 1 All of the time – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>12. How much pain from your knee interfered with your usual work (including housework)?</b></p> <p style="text-align: right;">Not at all – 4 A little bit – 3 Moderately – 2 Greatly – 1 Totally – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>
<p><b>6. Have you felt that your knee might suddenly give way or let you down?</b></p> <p style="text-align: right;">Rarely/never – 4 Sometimes or just at first – 3 Often, not just at first – 2 Most of the time – 1 All of the time – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>	<p><b>13. Have you been troubled by pain from your knee in bed at night?</b></p> <p style="text-align: right;">No nights – 4 Only 1 or 2 nights – 3 Some nights – 2 Most nights – 1 Every night – 0</p> <p style="text-align: right;">Score <input style="width: 40px; height: 30px;" type="text"/></p>

**Total Score:                    /48**

**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 [4], 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.

[4, 12, 23] 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.

### References

1. Fransen M, Bridgett L, March L, Hoy D, Penserga E, Brooks P. The Epidemiology of Osteoarthritis in Asia. *Int J Rheum Dis* 2011; 14(2):113-21.
2. <https://www.mindbodygreen.com/0-5812/4-simple-yet-powerful-ayurvedic-tips.html>
3. <https://blog.udemy.com/asian-squats/>
4. Kohli P, Rajurkar P, Nawale A, Warunjikar M, Nadkarni S. Results of unicompartmental knee arthroplasty in Indian rural population. Should uka be the first choice in surgical treatment for osteoarthritis in India. *IOSR Journal of Dental and Medical Sciences*. 2018; 17(2):01-08.
5. Brockett CM, Jennings LM, Fisher J. The wear of fixed and mobile bearing unicompartmental knee replacements J, *Engineering In Medicine*. 2010; 225(Part H):511-518.
6. Amin Ak, Patton Jt, Cook Re, Gaston M, Brenkel Ij. Unicompartmental Or Total Knee Arthroplasty?: Results From A Matched Study. *Clinorthoprelat Res*. 2006; 451:101-106.
7. Laurencin Ct, Zelicof Sb, Scott Rd, Ewald Fc. Unicompartmental Versus Total Knee Arthroplasty In The Same Patient. A Comparative Study. *Clinorthoprelat Res*. 1991; 273:151-156.
8. Yang Ky, Wang Mc, Yeo Sj, Lo Nn. Minimally Invasive Unicompartmental Versus Total Condylar Knee Arthroplasty--Early Results Of A Matched-Pair Comparison. *Singapore Med J*. 2003; 44:559-562.
9. Hassaballa Ma, Porteous Aj, Newman Jh. Observed Kneeling Ability After Total, Unicompartmental And Patellofemoral Knee Arthroplasty: Perception Versus Reality. *Knee Surg Sports Traumatolarthrosc*. 2004; 12:136-139.
10. Lombardi Av Jr, Berend Kr, Walter Ca, Aziz-Jacobo J, Cheney Na. Is Recover Faster For Mobile-Bearing Unicompartmental Than Total Knee Arthroplasty? *Clinorthoprelat Res*. 2009; 467:1450-1457.
11. Hopper Gp, Leach Wj. Participation In Sporting Activities Following Knee Replacement: Total Versus Unicompartmental. *Knee Surg Sports Traumatolarthrosc*. 2008; 16:973-979.
12. Von Keudell A, Sodha S, Collins J, *et al*. Patient Satisfaction After Primary Total And Unicompartmental Knee Arthroplasty: An Age Dependent Analysis. *Knee*. 2014; 21:180-184
13. Newman J, Pydisetty Rv, Ackroyd C. Unicompartmental Or Total Knee Replacement: The 15-Year Results Of A Prospective Randomised Controlled Trial. *J Bone Joint Surg [Br]*. 2009; 91-B:52-57.
14. Ahlbäck S. Osteoarthritis of the Knee. A Radiographic Investigation. *Acta Radiol Diagn (Stockh)*. 1968; Suppl277:7-72.2.
15. Chatterji U, Ashworth Mj, Lewis Pl, Dobson Pj. Effect Of Total Knee Arthroplasty On Recreational And Sporting Activity. *Anz J Surg*. 2005; 75(6):405-8.
16. Walton Np, Jahromi I, Lewis Pl, Dobson Pj, Angel Kr, Campbell Dg. Patient Perceived Outcomes And Return To Sport And Work: Tka Versus Mini-Incision Unicompartmental Knee Arthroplasty. *J Knee Surg*. 2006; 19(2):112-6.
17. Fisher N, Agarwal M, Reuben Sf, Johnson Ds, Turner Pg. Sporting And Physical Activity Following Oxford Medial Unicompartmental Knee Arthroplasty. *Knee*. 2006; 13(4):296-300.
18. Naal Fd, Fischer M, Preuss A, Goldhahn J, Von Knoch F, Preiss S. *et al*. Return To Sports And Recreational Activity After Unicompartmental Knee Arthroplasty. *Am J Sports Med*. 2007; 35(10):1688-95.
19. Hollinghurst D, Stoney J, Ward T, Gill Hs, Newman Jh, Murray Dw, *et al*. No Deterioration Of Kinematics And Cruciate Function 10 Years After Medial Unicompartmental Arthroplasty. *Knee*. 2006; 13(6):440-4.
20. Walton Np, Jahromi I, Lewis Pl, *et al*. Patient-Perceived outcomes and return to sport and work: Tka Versus Mini-Incision Unicompartmental Knee Arthroplasty. *J Knee Surg*. 2006; 19:112-116.
21. Murray Dw, Goodfellow Jw, O'connor Jj. The Oxford Medial Unicompartmental Arthroplasty: A Ten-Year Survival Study. *J Bone Joint Surg Br*. 1998; 80(6):983-9.
22. Svard Uc, Price Aj. Oxford Medial Unicompartmental Knee Arthroplasty. A survival analysis of an independent series. *J Bone Joint Surg Br Mar* 2001; 83(2):191-4.
23. Jahromi I, Walton Np, Dobson Pj, Lewis Pl, Campbell Dg. Patient-Perceived Outcome Measures Following Unicompartmental Knee Arthroplasty With Mini Incision. *Int Orthop*. 2004; 28(5):286-9.