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Original Research Article

Short term outcome of total knee replacement in Kashmiri population without co-morbidities

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ABSTRACT

Background: The aim of the study was to evaluate the patients of osteoarthritis of knee prior to surgery and then 6 weeks after the total knee replacement surgery with regards pain, range of motion, stability, deformity, quadriceps power and support.
Methods: This is a prospective follow up study. A minimum of 20 patients have been included in this study conducted in Department of Orthopedics, Bone and Joint Hospital Barzullah Srinagar, during the period of September 2014 to November 2016.
Results: The average age of patients was 59.63 years, more than 35% of the patients belonged to the age group 66-70 years, majority of the patients were females (70%) in the whole study group. Most (88.89%) cases were bilateral, affecting both knees. The mean pre-operative range of motion in 94.38 degrees. The mean postoperative range of motion was 113.75 degrees. Patients were followed up at 2, 4, 6 weeks postoperatively. The average blood loss was 500 ml and the average operating time was one hour and 15 minutes and one hour. There was one deep vein thrombosis, one delayed wound healing, one common peroneal nerve palsy and one valgus deformity.
Conclusions: The patients with more severely deformed knees, are more elderly, have more pain perception, their functional quality of life was impaired more, they were physically more dependent and their quality of life improves significantly after surgery.

Keywords: Knee functional score, Knee society score, Osteoarthritis, Total knee replacement

INTRODUCTION

Osteoarthritis is a dynamic phenomenon showing features of both destruction and repair, osteophytosis and remodeling.[1-3]

Osteoarthritis of knee joint is an extremely common condition. Predisposing factors include injuries to knee joint, ligamentous instability, torn menisci; increasing average age in Indian population and increasing awareness of the treatment modalities possible and a desire to improve the quality of life. Management depends on stage of the disorder, the severity of symptoms, the age of the patient and his or her functional needs. The knee joint replacement has become a common surgical procedure in India. However, it is necessary that an analysis of the patient after surgical procedure may be made.[4-6]

Total knee replacement is an operation to restore motion to the joint and function of the muscles, ligaments and other soft tissue structures that control the joint. Surgery should be considered only after an adequate trial of conservative therapy, including physical therapy, anti-

inflammatory medication, and modification of daily activities.[7]

Aim and objective of the study was to evaluate the patients of osteoarthritis of knee prior to surgery and then 6 weeks after the total knee replacement surgery with regards pain, range of motion, stability, deformity, quadriceps power and support.

METHODS

This study has been conducted in department of orthopedics, Bone and Joint Hospital, Barzullah, Srinagar during the period of September 2016 to November 2018.

Study design: Prospective follow up study.

Sample size: A minimums of 20 patients have been included in this study.

Inclusion criteria

Patients of either sex with age >50 years, with knees having osteoarthritis with more than 15 degrees of varus, more than 10 degrees of flexion deformity, excess lateral joint opening on varus stress test, less than 60 degree of range of motion at the knee joint and patients incapable of independent walking and using a walking aid for ambulation typically restricted to indoors.[9,10]

Exclusion criteria

Patients younger than 50 years, patients with serious systemic diseases compromising their pre-anesthetic fitness, patients with associated fractures of same limb, patients with local skin infections or remote infection which might have seeded in the joint and history of previous replacement or use of constrained condylar knee and high tibial osteotomy.[11]

Patients have been graded by knee society knee score, (100 point rating system for clinical evaluation of knee).[12] Standard total knee arthroplasty through anterior midline approach was performed.

Postoperative aim was to attain adequate soft tissue balance and 5-10 degree of valgus alignment between axes of femur and tibia. Any Modification from the standard procedure done in deformed knees was recorded. Postoperatively patients were assessed (by knee society knee score) 2, 4 and 6 weeks of surgery.[13]

Standard radiographs of knee joint (antero-posterior, lateral and Merchant/Skyline view) were taken up immediate post-operatively and in each follow-up. A comparison was done between immediate post-operative and follow up radiographs; mechanical axis alignment of femur and tibia. Evidence of loosening in various zones.[14]

RESULTS

Majority of patients were females 70% in the study group. 5.5% were right side and 5.5% were left side 88.89% were bilateral in the study group.

The average blood loss was 500 ml and average operating time was 1 hr 15 minutes. Mean preoperative pain score was 15 and post op pain score (6 weeks) was 46.87.

The mean pre op ROM was18.87 degrees and post op 22.75 degrees. The improvement in knee stability postoperatively was significant (p values= 0.039801 and 0.000308 respectively).

Patients with Dukes A stage did not receive postoperative chemotherapy and were advised regular follow up. 38 patients received post-operative chemotherapy. 18 patients were given radiotherapy. New evidence suggests a role for anti-inflammatory drugs in the treatment and prevention of colon and rectal cancers.

Table 1: Age distribution.

Age group (in years)	Total	%
50-55	1	5
56-60	4	20
61-65	2	10
66-70	7	35
71-75	5	25
>76	1	5
Total	20	100

Table 2: Flexion contracture.

Flexion contracture	Pre-op	Post-op
5-10	8	8
10-15	0	0
16-20	0	0
>20	0	0

Table 3: Extension lag.

Lag	Pre-op	Post-op
<10	8	8
10-20	0	0
>20	0	0

Majority of patients had varus alignment pre op 65% and post op were satisfactorily aligned except in one patient who had residual valgus deformity.

Majority of patients were house bound or were able to walk less than 5 blocks preoperatively. Weeks postop 90% were able to walk more than 10 blocks. 60% of the patients were able to climb stairs with support.

Only one patient was unable to climb stairs. Postoperatively all patients were able to climb stairs. The knee society score improved significantly postoperatively in the study group from 39.625 to 87.625. The knee society function score improved significantly at each follow up.

Table 4: Walking score accordingly to knee society function score.

Alignment	Pre-op	Post-op
Unlimited	0	1
>10 blocks	0	6
5-10 blocks	3	1
<5 blocks	3	0
House bound	2	0
Unable	0	0

Table 5: Knee society knee score follow up.

Follow up	Knee score	P value
2 weeks	68.125	0.000517
4 weeks	80.375	9.35×10^{-05}
6 weeks	87.625	0.025373

Table 6: Knee society function score.

Follow up	Mean function score	P value
2 weeks	8.13	0.296881
4 weeks	63.75	0.006141
6 weeks	79.38	0.050641
P value	3.6×10^{-05}	

Table 7: Complications.

Complications	N
Deep vein thrombosis	1
Infection	
Delayed wound healing	1
Hemarthrosis	
Valgus malignment	1
Neuro-vascular complication	1
Patello femoral complication	
Peri prosthetic fracture	
Medical complications	
Others	

The postoperative complications were deep vein thrombosis, delayed wound healing, residual vagus alignment and common peroneal nerve palsy one each.

DISCUSSION

In this study, a total of 36 knees were replaced in twenty patients using posterior stabilized type of total knee prosthesis (LPS Nexgen, Zimmer). The average age of the patients was 59.63 years. The youngest patient was 52 years and the oldest was 87 years in the whole study group. More than 35% of the patients belonged to the age group of 66-70 years. Majority of the patients were females (70%) in the whole study group.

Osteo-arthritis of both knees was found more common, than the individual knee involvement, this could be attributed to late presentation of symptoms, and pain tolerance, till the disease causes hampering of daily routine activities, common with our population.

5.5% were right side and 5.5% were left side, 88.89% were bilateral in the whole study group. Bilateral knees were operated in same sitting, which proved economical to the patient, and better compliance during rehabilitation period.

Pre-operative evaluation was done using knee society and function score. In this scoring system, knee score and function score are evaluated separately so ageing or deterioration in patients, general health do not affect his knee score as in the previous scoring systems. In this scoring system patients are evaluated under following criteria. Pain, range of motion, anterio-posterior stability, flexion contracture, extension lag, alignment, walking, stairs climbing, use of support.

After surgery, patients were evaluated at 2 weeks, 4 weeks and 6 weeks. Mean scores were compared at each follow up and statistical analysis done by student-t test.

The patients show better pain relief, good range of motion, early mobility, and short hospital stay Mean pre-operative knee score was 39.62. Mean postoperative knee score was 87.62 (p value 0.00000095). Mean preoperative function score was 39.37. Mean postoperative function score was 79.38 (P value 0.000036). Mean post- operative knee score was 87.62, the amount of improvement was appreciable.

With a mean preoperative score of 39.62 gained 48 points after surgery. The same happened with the function score, the gain in was 40.01 points.

Teeny et al, reported similar observations, they showed improvement in the function score in varus group by 60 points and in non-deformed group by 44 points.[15]

Mean pre-operative pain score, was 15 and post-operative pain score was 46.88 (p value 0.0000047). Therefore, significant relief in pain was noted in patients of study group. The mean pre-operative range of motion was 94.38 degree. The mean post-operative range of motion was 113.75 degrees. Hence, the gain in range of motion in was 19.37 degrees. The corresponding pre-op mean knee society score was 39.62 and the corresponding post-op mean knee society score was 87.62. It means significant improvement in range of motion has occurred.

Postoperatively, there was flexion contractures in the range of <5. The average blood loss in patients was about

500 ml. This observation was not different from that of findings of Teeny et al.[15]

Correction of deformity is felt to be one of the obstacles to overcome for successful maintenance of prosthetic interfaces and good clinical results. The aim of attaining 3-7 degree of valgus alignment between mechanical axis of femur and tibia was fulfilled in most of the cases.

Tew and waugh reviewed 428 cases, observed for 9 years, and noted that, the knees most likely to remain stable in long term follow-up were those aligned to a tibio-femoral angle of 7 degrees valgus.[16,17] This has also been our observation in this study, but further follow up analysis is needed to assess the long-term stability of these knees.

Figure 1: (A) Clinical photograph of both knees with varus deformity and (B) X ray of both knees (AP and lateral view with osteoarthites).

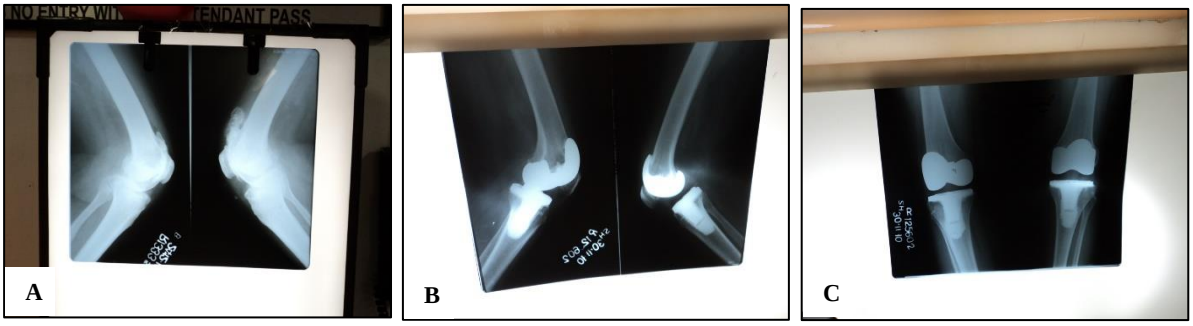

Figure 2 (A-C): X ray of both knees (lateral and AP view) with total knee replacement.

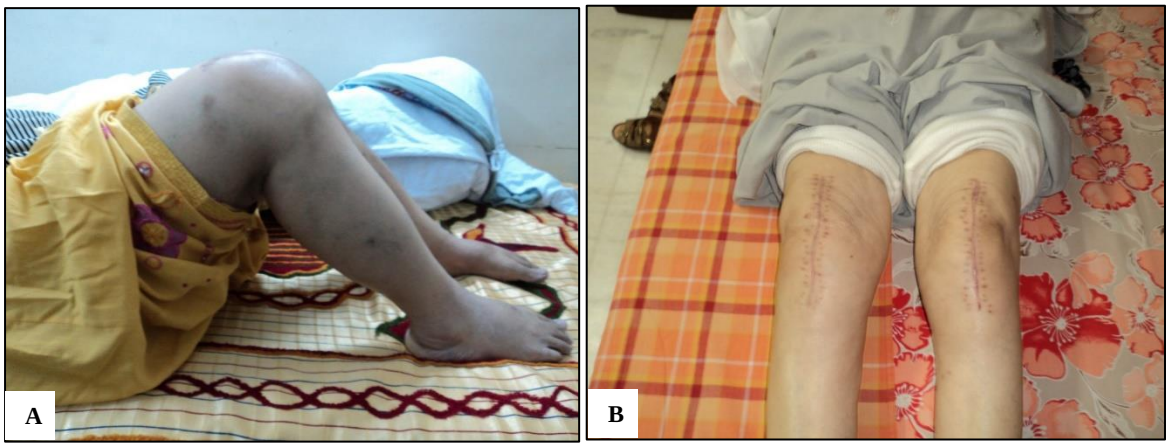

Figure 3 (A and B): Postoperative clinical photograph of both knees.

Ewald et al, reviewing, the results of 124 knees noted that the knees, which had a pre-operative varus deformity, also tended to remain in varus post-operatively.[18,19] Residual varus primarily of tibial component accounted of the overall varus alignment of the limb, however our experience has been of full correction after adequate soft tissue balancing in most of the cases.

Peterson et al likewise found on analysing a randomized group of fifty total knee arthroplasties, that in 26% of their cases, the post-operative alignment fell out of their desired range of 4-10 degrees of valgus.[20]

The philosophy for correction of varus deformity was similar to that proposed by Insall et al.[21] They described correction of varus deformities by progressive release of medial soft tissues until they reach the length of lateral ligamentous structure. Because the superficial collateral ligament is invested by capsule and connective tissue in relationship to the PES tendon group, complete release of this structure from the tibia has usually not been accompanied by gross medical instability as one might expect. If it were to be release from femur, Insall et al, recommend complete correction of deformity before making the bone cuts.[21]

Teeny et al, found in their study of total knee arthroplasty in patients with severe varus deformity, that after preliminary dissection around the medial and posterior aspect of the tibia to provide exposure, making a high preliminary tibial cut and the usual distal femoral cut, facilitates evaluation of the flexion and the extension gaps.[15] they found that soft tissue balancing then can be completed and a lower tibial cut made if necessary. The same findings were observed in this study. Insall et al, proposed excising both cruciate ligaments before starting the medial release and proposed the use of a posterior cruciate substituting prosthesis.[21] However, according to Teeny et al, routine excision of PCL is not necessary.[15]

We have excised both cruciate ligaments in all cases. Excision of posterior cruciate ligament gives better exposure of posterior part of the knee, especially in severely deformed knee. Laskin reported the use of medial capsule recession to correct varus deformity.[22]

Deep vein thrombosis

This is a complication reported quite commonly in the western literature. Clark et al, have reported more than 1.72% incidence of deep vein thrombosis. [23]

One of our patient developed deep vein thrombosis, which was managed medically by anticoagulation therapy, and patient recovered well.

Delayed wound healing

One of our patient developed delayed wound healing near tibial end of incision line. It was treated by, regular dressings, medicines and high nutrition.

Teeny et al, had reported one case with superficial skin neurosis over the patella out of 27 knees.[15] Clark et al, reported 3.095 wound related complications including infection, hematoma, etc.[23] Insall et al, in their series, posterior stabilized prosthesis reported 16% wound complication including hematoma, persistent drainage.[21]

Common peroneal nerve palsy

One patient of severely deformed knee, developed common peroneal nerve (CPN) palsy post operatively. Nerve palsy started recovering in few days, with regular physiotherapy and multivitamins, and by four weeks, fully recovered.[24]

Valgus deformity

It occurs due to excessive soft tissue release on medial side.

CONCLUSION

After the study, we conclude that the patients who have more severely deformed knees, are more elderly, have more pain perception, their functional quality of life was impaired more and their quality of life gets are significantly improved.

The future research agenda should focus on how, community action programmes focusing on modifiable risk factors like, obesity, diabetes, hypertension, gout may impact occurrence of osteoarthritis(primary and secondary prevention) and symptom improvement in patients with existing osteoarthritis (tertiary prevention).

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