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A study of short term outcome of total knee arthroplasty in the treatment of primary osteoarthritis of knee joint using knee society score

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Abstract

Objective: This study focuses on short term outcome of total knee arthroplasty in the treatment of primary osteoarthritis of knee joint using knee society score.

Introduction: Total knee replacement is highly efficacious operation to substitute for kinematic and dynamic function of human knee against advanced arthritis. Modern total knee arthroplasty is effective and durable in the younger, more active patient, as well as in the elderly population.

Methodology: A cohort of 40 patients with primary osteoarthritis of knee joint, treated with total knee arthroplasty between Jan 2016 to Dec 2017 were analyzed for minimum of 6 months and final results were analyzed using Knee Society Score.

Results: 95% patients had excellent and 5% patients had good results. Assessment done using Knee Society Score.

Keywords: Total knee replacement, Knee Society Score

Introduction

Total knee replacement is highly efficacious operation to substitute for kinematic and dynamic function of human knee against advanced arthritis.¹ Primary osteoarthritis of knee is more common as compared to other joint. In the last twenty years, the quality of total knee arthroplasty has consistently improved, which resulted in decreasing the indication for other surgical procedures such as synovectomy, debridement, osteotomy and arthrodesis of knee joint^[1]. This operation has become widely accepted to afford pain relief, restoration of range of motion and function. Modern total knee arthroplasty is effective and durable in the younger, more active patient, as well as in the elderly population.

Methodology

This study focuses on short term outcome of knee arthroplasty in patients with primary osteoarthritis of knee joint using knee society score. The observational prospective study was conducted at tertiary care hospital between January 2016 to December 2017. 40 patients of primary osteoarthritis of knee joint treated with total knee arthroplasty included in study based on following inclusion and exclusion criteria.

Inclusion Criteria

- Any patient with primary osteoarthritis of knee joint was included in study.

Exclusion Criteria

- Recent or current knee sepsis.
- Remote source of ongoing infection.
- Extensor mechanism deficiency or severe discontinuation.
- Secondary osteoarthritis of knee joint.

Detailed local examination of knee was done to note the attitude of limb, range of motion, stability in anteroposterior and mediolateral plane, any flexion contracture, extensor lag and distal neurovascular status. Opposite knee was examined to rule out bilateral involvement. Same side hip and ankle also examined. Radiographs were taken in AP standing and lateral

view of knee joint. The pre operative medical evaluation included chest X-ray, ECG, CBC & ESR, HIV, HBsAG, RA, CRP, LFT, RFT, RBS, Sickling test. All patients were operated using standard metal on polyethylene total knee arthroplasty implant by standard median parapatellar approach. Post operatively patients were encouraged to perform static quadriceps and hamstring exercise. The flexion and extension exercises were performed, active and assisted, as early as possible as the pain becomes tolerable and patients began walking with the help of a walker by the first post operative day and with the help of cane after 2 weeks.

Observation and Analysis

All patients were periodically assessed clinically, functionally and radiologically according to Knee Society Scoring system at 1 month, 3 months and 6 months interval during follow up. 40 patients of primary osteoarthritis of knee joint were included in the study.

Table 1: Age distribution

Age group(in years)	No. of patients	Percentage
41-50	8	20
51-60	12	30
61-70	12	30
71-80	4	10
>80	4	10
Total	40	100

Table 2: Pain

Pain	Pre op	Post op
None	0	26 (65%)
Mild	2 (5%)	14 (35%)
Moderate	12 (30%)	0
Severe	26 (65%)	0
Total	40 (100%)	40 (100%)

Table 3: Range of motion

Range (Excluding FFD)	Pre op	Post op
0 to 40	0	0
41 to 50	4 (10%)	0
51 to 60	16 (40%)	0
61 to 70	4 (10%)	0
71 to 80	8 (20%)	0
81 to 90	8 (20%)	2 (5%)
>90	0	38 (95%)

Table 4: Instability

Instability	Pre op	Post op
<5 mm	4 (10%)	40 (100%)
5-10 mm	36 (90%)	0
>10 mm	0	0

Table 5: Flexion deformity

Flexion deformity(degrees)	Pre op	Post op
<5	34 (85%)	40 (100%)
6-10	4 (10%)	0
11-20	2 (5%)	0
>20	0	0

Table 6: Extensor lag

Extensor lag (degrees)	Pre op	Post op
None	34 (85%)	40 (100%)
<4	2 (5%)	0
5-10	4 (10%)	0
>11	0	0

Table 7: Alignment

Alignment (degrees)	Pre op	Post op
Varus (0-15)	40 (100%)	0
Valgus (0-10)	0	40 (100%)

Table 8: Function

Walking	Pre op	Post op
Unlimited	0	12 (30%)
10-20 blocks	8 (20%)	28 (70%)
5-10 blocks	12 (30%)	0
1-5 blocks	16 (40%)	0
<1 block	4 (10%)	0
Can not	0	0
Stairs and chairs	Pre op	Post op
Normal up and down	0	28 (70%)
Up and down with hand balance	10 (25%)	12 (30%)
Up and down with hand pull	30 (75%)	0
Can not	0	0
Walking aid	Pre op	Post op
Cane	6 (15%)	0
Walker	6 (15%)	0
None	28 (70%)	40 (100%)

Table 9: Complications

Complications	No. of patients
Nerve injury	0
Vascular injury	0
Fracture	0
Rupture of extensor mechanism	0
Rupture of collateral ligaments	0
Thrombo embolism	0
Infection	0
Periprosthetic fracture	0
Patello femoral complications	0
Dislocation/subluxation	0

Table 10: Results

Results	Excellent (85-100 score)	Good (70-84 score)	Fair (60-69 score)	Poor (<60 score)
Pre op	0	1(2.5%)	3 (7.5%)	36 (90%)
Post op	38(95%)	2 (5%)	0	0

In our study majority (80%) of patients were in 41-70 years of age group. In our study, 65% patients have no pain and 35% have mild pain at final follow up of 6 months. The average range of motion was 110° at final follow up and none of the patient had extensor lag or flexion deformity at final follow up. All of the patients had an average normal valgus angle of knee (<10°) at final follow up. At final follow up, 30% patients could walk unlimited and 70% patients could walk up to 10-20 blocks. At final follow up, 70% patients could climb stairs up and down normally and 30% patients could climb with hand support. At final follow up, none of our patients required walker or cane for support to walk. At final follow up, there was a significant improvement in Knee Society Score post operatively than pre operative score.

Discussion

A positive outcome in TKR is influenced by the complex interaction between the soft tissue structure surrounding the joint and the geometry of the prosthetic design. This was the randomized prospective study, which was aimed to evaluate the results of the fixed bearing device as regards to the functional and radiological results of the TKR at 6 months

post operatively. Young-Hoo *et al.* [2] analyzed 116 primary TKRs with fixed bearing arthroplasty, with a mean follow up of 7.4 years. The results showed pain score improvements with a mean of 0 points pre operatively to a mean of 48.1 points post operatively. These results are comparable to the values for pain scores achieved in our study. Agrawal and Agrawal *et al.* [3] showed that mean post-operative range of motion was 110.5° (80-125°) in the fixed TKR and all patients were satisfied with the outcome of the procedure. As regards to the KSS, Woo *et al.* [4] reported in their study that the mean improved significantly from 47.6 to 89.7 postoperatively. All functional results were comparable to the results of our study which may be due to similar inclusion and exclusion criteria of patients selected in all studies.

Conclusion

In our study 95% patients had excellent results and 5% patients had good results. There were no complications developed intra operatively and post operatively. Limitations of this study were small population (40 patients) and short term follow up (6 months). In our study, we tried to evaluate the results of fixed bearing design in regarding of clinical, functional and radiological outcome of TKR at 6 months post operative interval. Evaluation of pain relief, range of movement and improved functions of all the patients were carried out, but implant durability and late complications were outside the scope of this study, because it requires the longer follow up. The present study shows that the total knee replacement is a safe option for primary osteoarthritis of knee joint in the elderly patients.



Fig 1: Pre operative ap x ray



Fig 2: Pre-operative x rays

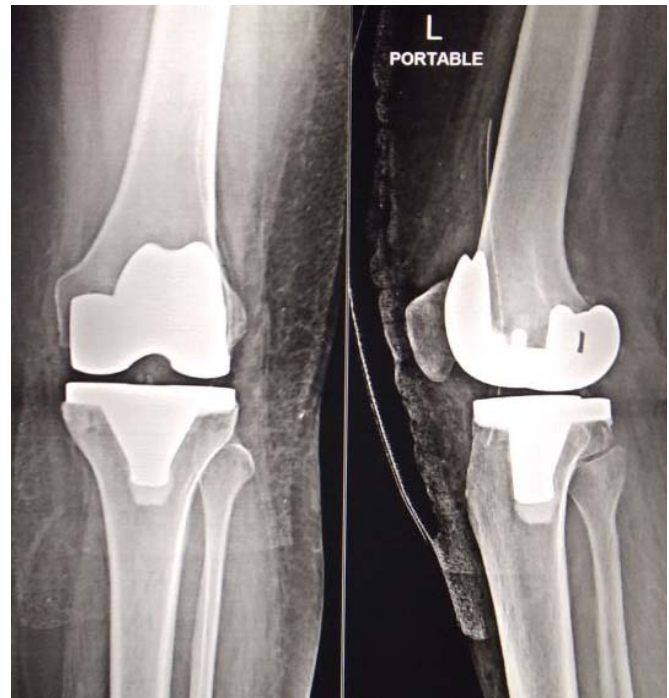


Fig 3: 6 months post op x ray

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