



FUNCTIONAL OUTCOME OF TOTAL KNEE ARTHROPLASTY IN RHEUMATOID ARTHRITIS PATIENTS- A PROSPECTIVE STUDY

Orthopaedics

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ABSTRACT

AIM: To study the functional outcome after total knee replacement in rheumatoid arthritis patients. **METHODS:** This study is a prospective, single center trial involving 22 PATIENTS from SREE BALAJI MEDICAL COLLEGE AND HOSPITAL ,CHROME PET followed up for a minimum period of 2 YEARS. This study was conducted between January 2016 to December 2019. **RESULTS:** In this study involving 22 rheumatoid arthritis patients with Kellen Lawrence classification grade 4 with or without deformity, TKR was done to improve functional outcome. 20 (90%) out of 22 patients had no or minimal symptoms after surgery. 2 patients had though a satisfactory outcome had some functional difficulties . **CONCLUSION:** In our study, the post operative complications like infection and adverse cardiovascular events were relatively less. The OXFORD KNEE SCORE and VISUAL ANALOG SCALE showed good functional outcome in most patients.

KEYWORDS

INTRODUCTION

Rheumatoid arthritis is an autoimmune disease involving multiple joints leading to inflammatory destruction of the involved joint surfaces due to underlying synovial proliferation . This polyarticular disease if allowed to progress can lead to severe secondary arthritis and morbid deformities . The long term effects of RA can be prevented or its aggression controlled by disease modifying anti rheumatoid drugs(DMARDs).

Arthroplasty of the knee in end stage deformed knee is a costly consequence of a progressive disease. Though the number of knee replacement has greatly reduced due to the more evolving treatment approaches and novel DMARDs(especially TNF- α inhibitors),many severe arthritic knees still utilise total knee replacement.^[1-10]

TKR in end stage arthritic knee has its own advantages such as return of painfree range of movements and ambulatory status of the patient. But the RA patients are at higher risk of post operative adverse events than normal population after TKR especially infection^[11-17].

The effect of Intensive postoperative physiotherapy is promising and reduces the rate of readmission^[18]. This study comprises 22 patients who underwent total knee arthroplasty and their functional outcomes are studied using oxford knee score and visual analog scale .

MATERIALS AND METHODS

This study includes 22 patients who are diagnosed with rheumatoid according to ACR criteria with end stage severe arthritis who came to SBMCH and underwent surgery in our hospital from JANUARY 2016 TO DECEMBER 2019. Pateint recruitment was from JANUARY 2016 to DECEMBER 2017.The follow up period was for period of minimum 24 months and maximum 36 months.

INCLUSION CRITERIA

- Age More Than 50 Years
- Severe Osteoarthritis And Pain
- Diagnosed Rheumatoid Arthritis According To Acr Criteria

EXCLUSION CRITERIA

- Any Infection
- Revision Tkr
- Mild And Moderate Oa
- Surgically Unfit Patients
- Debilitated Patients

ACR CRITERIA FOR DIAGNOSIS

PATEINT WITH CLINICAL SYNOVITIS NOT EXPLAINED BY OTHER CAUSE

1.NUMBER OF JOINTS INVOLVED	3. LAB VALUES	
1 LARGE JOINT	NORMAL ESR AND CRP	0
2-10 LARGE JOINTS	ABNORMAL ESR AND CRP	1
1-3 SMALL JOINTS		
4-10 SMALL JOINTS		
>10 JOINTS		
2.SEROLOGY	4.DURATION OF SYMPTOMS:	
NEGATIVE RF AND ACPA	<6 WEEKS	0
LOW POSITIVE RF AND ACPA	>6 WEEKS	1
HIGH POSITIVE RF AND ACPA		

ACR : AMERICAL COLLEGE OF RHEUMATOLOGY

PROCEDURE

The preoperative medical history will be carefully documented according to routine screening for TKR surgery. The preoperative planning will include plain radiographs of the operated knee and standing long axis radiograph of the affected limb. Specific attention will be paid to record history of chronic pain, long- standing pain medication, a history of fibromyalgia, depression, anxiety, or other mental disturbances.

TKR was done through medial parapatellar approach. The distal femoral bony landmarks were used to identify the proper rotation of the femur. Femoral resection was performed using intra medullary guide followed by tibial resection using extramedullary guide.soft tissue balancing was done using tension device.

Constrained devices are used for instability and posterior substituting implants were used in all other cases.

In the post operative period , intensive physiotherapy was started from the next day of surgery.

Patients were reviewed weekly once for first four weeks and fortnightly for next four weeks ,from third month to 1 year follow up was done every month and from then on every year once the patient was reviewed. On every visit , radiographs of the knee were taken and movements of the knee were measured using goniometer . Power of the different muscles , Stability of the joint and movements were noted. Patient reported outcome was measured using OXFORD KNEE SCORES.

ILLUSTRATIONS



RESULTS

A total of 30 patients were selected of which 16 were males and 14 were females.

SEX DISTRIBUTION

MALE	7
FEMALE	15

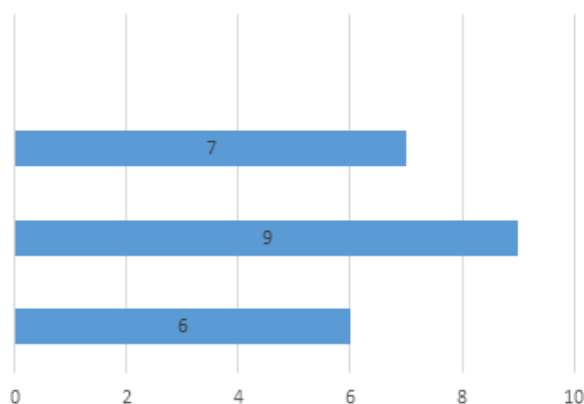


The age distribution of the patient was 15 were between age 20 and 30, 6 were between 31 and 40, 6 were between 41 and 50, 1 was between 51 and 60, 1 was between 61 and 70.

AGE DISTRIBUTION

50-60 yrs of age	6
61-70 yrs of age	9
>70 yrs of age	7

AGE DISTRIBUTION



Side involved:

Right side of knee is involved in 12 out of 22 patients and Left side of knee is involved in 10 out of 22 patients.

Right	left
12	10

Type of approach:

In all the cases medial parapatellar approach is used for the surgery.

Duration of surgery:

The mean duration of surgery was 90 minutes.

Oxford knee score:

Score	Grading of severity	No. of knees
0 to 29	Moderate or severe	0
30 to 39	Mild	2
40 to 48	satisfactory	20

Visual analog scale scores:

The VAS scores are satisfactory for all the cases.

Post operative complications:

1.superficial infection	3
2.wound complications	1
3.persistent discharge	1
4.stiffness/laxity	5

DISCUSSION

In our study the number of female patients was slightly higher than the male patients. Moreover people of age group 61 to 70 were mostly operated.

Our study has shown satisfactory outcomes according to oxford knee score in all 22 patients. This result is consistent with the popular published series by goodman et al. TKR in fully blown out knee joints of rheumatoid arthritis was shown to give excellent results.

Visual analog scale showed less than 5 in about 90 % of the cases.

Our study cannot be generalized over the region because it is a single center trial. Further long term follow up are necessary to study about other complications that occur long term in replacement and outcomes at later stages with revision surgeries.

CONCLUSION

Total knee Replacement in osteoarthritic knee due to inflammatory pathology like rheumatoid arthritis is a life changing procedure for patients with good functional outcome in short term.

However experience of the surgeon and selection of patients plays a vital role in the outcome following surgery.

MASTER CHART

S. No	Ip.No.	Name	Sex	Age	Vas	Oxford knee score	Grading of severity
1	1532698	PATTAMAAL	F	65	2	48	satisfactory
2	5963278	KUMARI	F	54	3	40	satisfactory
3	5236419	SHIVANANDHAM	M	36	1	50	satisfactory
4	1526987	KASTHURI	F	24	5	44	satisfactory
5	4512986	MUNIYAMMAL	F	49	1	44	satisfactory
6	6325987	RAJI		27	2	48	satisfactory
7	5523698	MEENATCHI	F	42	3	40	satisfactory
8	7458911	MANOHARI	F	23	6	38	satisfactory
9	5644789	SWATHI	F	34	2	44	satisfactory
10	6512349	NANDAKUMAR	M	46	2	42	satisfactory
11	8457921	MADHANI	F	25	1	41	satisfactory
12	2548731	PRABU	F	37	1	42	satisfactory
13	9854712	ABDUL	F	33	2	48	satisfactory
14	6325487	RAJ	M	43	3	40	satisfactory
15	9513574	MANIMEGALAI	F	27	3	42	satisfactory
16	2851364	KANNAN	M	45	4	38	satisfactory
17	8495321	MANIMARAN	M	35	1	42	satisfactory
18	7412365	RANIMA	F	48	2	48	satisfactory
19	9632145	BABU	M	38	6	40	satisfactory
20	9812349	KUMAR	M	46	4	40	satisfactory
21	6857921	SUNDARI	F	25	2	48	satisfactory
22	5248731	PRABAHARAN	M	37	2	48	satisfactory

REFERENCES

- Louie GH, Ward MM. Changes in the rates of joint surgery among patients with rheumatoid arthritis in California, 1983-2007. Ann Rheum Dis. 2010;69(5):868-71. [PMC free article][PubMed][Google Scholar]
- Jansen E, Virta LJ, Hakala M, Kauppi MJ, Malmivaara A, Lehto MU. The decline in joint replacement surgery in rheumatoid arthritis is associated with a concomitant increase in the intensity of anti-rheumatic therapy: a nationwide register-based study from 1995 through 2010. Acta Orthop. 2013;84(4):331-7. [PMC free article][PubMed][Google Scholar]
- Mertelsmann-Voss C, Lyman S, Pan TJ, Goodman SM, Figgie MP, Mandl LA. US trends in rates of arthroplasty for inflammatory arthritis including rheumatoid arthritis, juvenile

- idiopathic arthritis, and spondyloarthritis. *Arthritis Rheumatol.* 2014;66(6):1432–9. [PubMed][Google Scholar]
4. Shourt CA, Crowson CS, Gabriel SE, Matteson EL. Orthopedic surgery among patients with rheumatoid arthritis 1980–2007: a population-based study focused on surgery rates, sex, and mortality. *J Rheumatol.* 2012;39(3):481–5. [PMC free article] [PubMed] [Google Scholar]
 5. David G, Tandon N, Waters H, Gunnarsson C, Kavanaugh A. Rheumatoid Arthritis and Joint Replacement: Impact of Biologics. *American Journal of Pharmaceutical Benefits.* 2014;6(6):256–64. [Google Scholar]
 6. Nystad TW, Fenstad AM, Furnes O, Havelin LI, Skrederstuen AK, Fevang BT. Reduction in orthopaedic surgery in patients with rheumatoid arthritis: a Norwegian register-based study. *Scand J Rheumatol.* 2015;1–7. [PubMed][Google Scholar]
 7. Harty L, O'Toole G, FitzGerald O. Profound reduction in hospital admissions and musculoskeletal surgical procedures for rheumatoid arthritis with concurrent changes in clinical practice (1995–2010) *Rheumatology (Oxford)* 2015;54(4):666–71. [PubMed] [Google Scholar]
 8. Hekmat K, Jacobsson L, Nilsson JA, Petersson IF, Robertsson O, Garellick G, et al. Decrease in the incidence of total hip arthroplasties in patients with rheumatoid arthritis—results from a well defined population in south Sweden. *Arthritis Res Ther.* 2011;13(2):R67. [PMC free article] [PubMed] [Google Scholar]
 9. Singh J, Y B, Watson S, Perez J, McGwin G, Ponce B. Trends in Joint Replacements Surgery in Patients with Rheumatoid Arthritis. *Arthritis Rheumatol.* 2016;68(suppl 10) [Google Scholar]
 10. Hawley S, Cordtz R, Dreyer L, et al. Association between NICE guidance on biologic therapies with rates of hip and knee replacement among rheumatoid arthritis patients in England and Wales: An interrupted time-series analysis. *Semin Arthritis Rheum.* 2018;47(5):605–610. doi:10.1016/j.semarthrit.2017.09.006
 11. Shah UH, Mandl LA, Mertelmann-Voss C, Lee YY, Alexiades MM, Figgie MP, et al. Systemic lupus erythematosus is not a risk factor for poor outcomes after total hip and total knee arthroplasty. *Lupus.* 2015;24(9):900–908. doi: 10.1177/0961203314566635. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
 12. Goodman SM, Johnson B, Zhang M, Huang WT, Zhu R, Figgie M, et al. Patients with Rheumatoid Arthritis have Similar Excellent Outcomes after Total Knee Replacement Compared with Patients with Osteoarthritis. *J Rheumatol.* 2016;43(1):46–53. doi: 10.3899/jrheum.150525. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
 13. Ravi B, Croxford R, Hollands S, Paterson JM, Bogoch E, Kreder H, et al. Increased risk of complications following total joint arthroplasty in patients with rheumatoid arthritis. *Arthritis Rheumatol.* 2014;66(2):254–263. doi: 10.1002/art.38231. [PubMed] [CrossRef] [Google Scholar]
 14. Ravi B, Croxford R, Hollands S, Paterson MJ, Bogoch E, Kreder H, et al. Patients with rheumatoid arthritis are at increased risk for complications following total joint arthroplasty. *Arthritis Rheum.* 2013;66(2):254–263. doi: 10.1002/art.38231. [PubMed] [CrossRef] [Google Scholar]
 15. Singh JA, Inacio MC, Namba RS, Paxton EW. Rheumatoid arthritis is associated with higher 90-day hospital readmission rates compared to osteoarthritis after hip or knee arthroplasty: A cohort study. *Arthritis Care Res (Hoboken)* 2014;67(5):718–724. doi: 10.1002/acr.22497. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
 16. Salt E, Wiggins AT, Rayens MK, Morris BJ, Mannino D, Hoellein A, et al. Moderating effects of immunosuppressive medications and risk factors for post-operative joint infection following total joint arthroplasty in patients with rheumatoid arthritis or osteoarthritis. *Semin Arthritis Rheum.* 2017;46(4):423–429. doi: 10.1016/j.semarthrit.2016.08.011. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
 17. Mandl LA, Zhu R, Huang WT, Zhang M, Alexiades MM, Figgie MP, et al. Short Term Total Hip Arthroplasty Outcomes in Patients with Psoriatic Arthritis, Psoriasis Skin Disease, and Osteoarthritis. *Arthritis Rheumatol.* 2015;68(2):410–417. doi: 10.1002/art.39431. [PubMed] [CrossRef] [Google Scholar]
 18. Bade MJ, Stevens-Lapsley JE. Early high-intensity rehabilitation following total knee arthroplasty improves outcomes. *J Orthop Sports Phys Ther.* 2011;41:932–41. [PubMed] [Google Scholar]
 19. Goodman SM, Johnson B, Zhang M, Huang WT, Zhu R, Figgie M, Alexiades M, Mandl LA. Patients with Rheumatoid Arthritis have Similar Excellent Outcomes after Total Knee Replacement Compared with Patients with Osteoarthritis. *J Rheumatol.* 2016 Jan;43(1):46–53. doi: 10.3899/jrheum.150525. Epub 2015 Dec 1. PMID: 26628605; PMCID: PMC5065063.