ORIGINAL ARTICLE

Functional Outcome of Total Knee Replacement in Patients with Rheumatoid Arthritis

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ABSTRACT

Objective: To evaluate the functional outcome of Rheumatoid Arthritis (RA) undergoing primary total knee arthroplasty (TKA).

Methods: Data was analyzed from Pakistan National Joint Registry (PNJR) from April 2014 to April 2015 to assess functional outcome of all patients who underwent TKA by a single surgeon and had a diagnosis of rheumatoid arthritis using Knee Society Scores (KSS) preoperatively and postoperatively at 3 months, 6 month and 1 year.

Result: Out of 39 patients 31 were female and 8 were male with mean age of 55.58±8.35 and mean Body Mass Index of 29.21±4.80.Within 39 patients, 22 patients had left sided TKA and 17 patients had right sided TKA. The mean average of Knee and Function score was 95.38±1.23 and 94.17±9.87 respectively after 1 year follow up. Average knee range of motion had increased from 98.52±2.46 degrees preoperatively to 109.37±3.61 degrees postoperatively.

Conclusion: Total knee arthoplasty in patients with rheumatoid arthritis is a good surgical option with about 71.8 percent of people having excellent functional outcome according to knee society scoring system.

INTRODUCTION

In patients suffering from chronic rheumatoid arthritis (RA) knee is one of the most commonly affected joints. Unlike primary degenerative osteoarthritis and few specific features characterize rheumatoid arthritis. From mild disease to severe joint destruction, leading to unremitting pain and deformities of joints [1,2,3]. Joint instability, contracture and osteoporosis are also its features. Due to chronic inflammatory process or chronic steroid use, patients with RA have poor bone quality, which may lead to worse outcomes including joint arthroplasty [4].

In patients with osteoarthritis, knee damage is often a localized problem for which TKR is an effective option. However, RA is a systemic disease, knee destruction is only one component, multiple joints involvement may not lead to the same degree of functional improvement compared to Osteoarthritis. Due to immunosuppresion and wound healing problems, RA patients are more susceptible to postoperative complication of arthroplasty compared to OA. Such as there is three times higher risk of infections in RA patients compared to OA patients [5,6,7]. And the functional outcome of the surgery is greatly influenced by such characteristics.

We carried out this study to assess the functional outcome of total knee replacement in patients with rheumatoid arthritis due to having limited available literature.

METHODS

It was a cross sectional, observational study conducted at Liaquat National Hospital (LNH), patients who underwent total knee arthroplasty due to primary diagnosis of RA during April 2014 to April 2015 were selected. The diagnosis of RA was made based on criterion given by American association of Rheumatologists. All the patients were positive for RA factor and received medical treatment for RA previously or during the time of study.

Before surgery, patient's demographic details: height, weight, body mass index and comorbids documented in Pakistan National Joint Registry. Range of motion and other assessments required to calculate Knee Society Score (KSS) was done and also documented in the registry. All procedures performed by one surgeon using tourniquet, midline skin incision and medial parapatellar approach. In all the patients, posterior-stabilized TKA was done and they received

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standard tibial and femoral implant. Patellar resurfacing was done in all patients.

Postoperative care was similar in all patients with intravenous antibiotic Cefuroxime and moxifolxacin for 72 hours. Epidural analgesia for first 48 hours in addition to appropriate I/V and oral analgesia, subcutaneous injection Enoxaparin for thromboprophylaxis from the first postoperative day and oral agent (Aspirin or Rivoraxaban) on discharge. Patients began ambulation on 1st postoperative day under the supervision of physiotherapist with active range of motion from 3rd postoperative day. On discharge, patients were followed in OPD at 2 weeks' time for removal of skin staples, 6 weeks, 3 months, 6 months and 12 months. In each visit, the same surgeon examined the patient for any sign of wound or joint infection. At 12 months' time, detailed review of the patients, which included range of motion and calculation of Knee Society Score, was done. Statistical analysis were examined using SPSS version 21.

RESULTS

Out of 39 patients, 31 were female and 8 were male. It was observed that 22 patients had left sided TKA and 17 patients had right-sided TKA. The mean age of patients was 55.58±8.35 and mean BMI was 29.21±4.80. More specifically it was noted that 29 patients were Hypertensive, 11 were Diabetic, 3 were having Hepatitis and 01 had Asthma, and 33 were in ASA grade II.

13 patients were community ambulatory without support, 10 patients were community ambulatory with support, 6 patients were home ambulatory without support, 7 patients were home ambulatory with support, and 3 patients were non-ambulatory.

At 1-year follow up by using Knee Society Scoring system, mean Knee score was 95.38±1.23 and mean Functional score was 94.17±9.87. The average preoperative and postoperative Range of Motion was 98.52 ±2.46 and 109.37±3.61 respectively. Based on functional score 28 knees (71.8%) had score of 81-100 (excellent result), 8 knees (20.5%) had score of 61-80 (good result), 3 knees (7.7) had score of 41-60 (fair result) and 0 knee had score of below 40 (poor result).

Age and weight of the patients at the time of presentation doesn`t have direct linear correlation to functional outcome. However morbidly obese patients took longer time to achieve better functional scores.

Gender

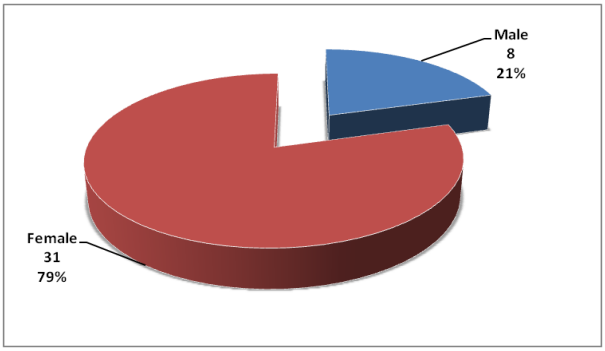


Table 1: Demography and comorbidities

Demography		
Mean ±SD		
Age (years)	55.58±8.35	
BMI	29.21±4.80	
Comorbidities		
	N (%)	
DM	Yes	11(28.2)
	No	28(71.8)
HTN	Yes	29(74.4)
	No	10(25.6)
Asthma	Yes	1(2.6)
	No	38(97.4)
Hepatitis	Yes	2(5.1)
	No	37(94.9)
ASA Grade	Grade I	1(2.6)
	Grade II	33(84.6)
	Grade III	5(12.8)

Table 2: Ambulation

Ambulation N (%)		
Ambulator	Community Ambulator	23(59)
	Home Ambulator	13(33.3)
	Non Ambulator	3(7.7)

Table 3: Knee Society Scores

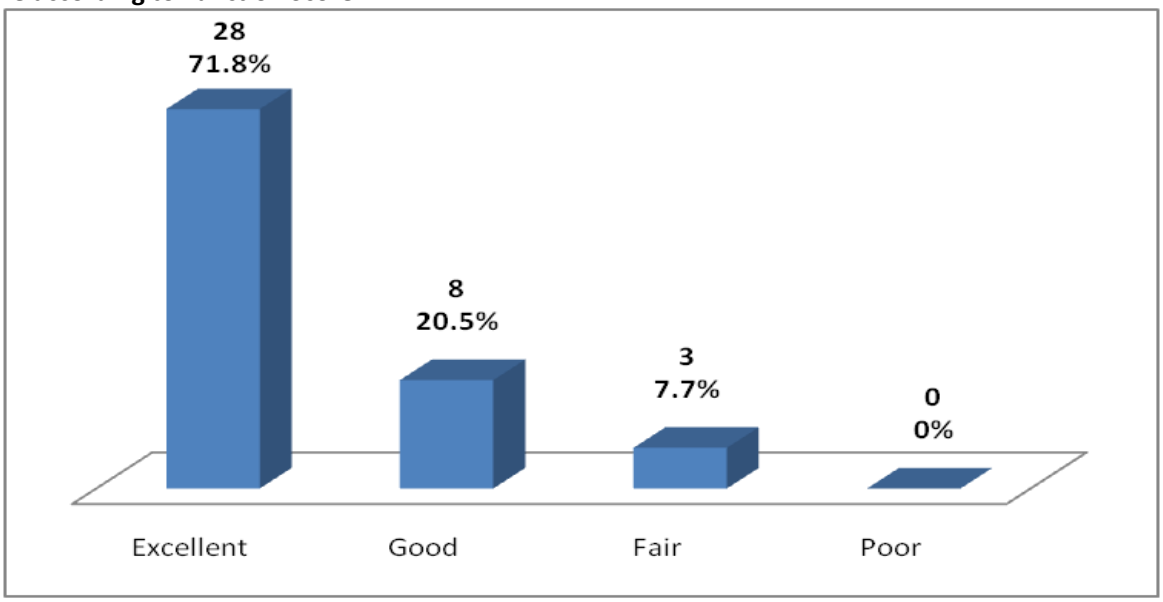
Knee Score (Mean ±SD)		**P-Value**
Pre Knee Score	36.97±1.86	0.00*
Post Knee Score	95.38±1.23	
Function Score (Mean ±SD)		
Pre Function Score	31.41±2.97	0.00*
Post Function Score	94.17±9.87	

Paired t-test Applied

*P-value≤0.05 considered as Significant

**P-Value>0.05, Considered as Insignificant

Outcome according to Function Score



DISCUSSION

For patients with end-stage refractory knee arthritis, Total knee arthroplasty (TKA) is an effective surgery. Significant improvement in function and relief of pain [8] of patients with RA [9] after total knee arthroplasty [10]. It is important to assess specific characteristics that can affect outcome in patients undergoing TKA just like associated comorbids, demographic characteristics, preoperative elements, social characteristics, and 30 days postoperative complications [11]. Risk factors such as poor baseline function and pain were associated with poor outcomes [12]. Compared to OA rate of complications like infection and revision dislocation after primary TKA were higher in RA [13].

Jabalameli M studied fourteen patients for an average of 50.3 months having RA and went through total knee arthroplasty. The mean knee and function score were 93 (±4.49) and 73 (±27.99) respectively [14]. In our study the mean Knee and Function score were 95.38±1.23 and 94.17±9.87 respectively after 1 year follow up.

Gill studied comparative clinical results of TKA in OA (37 knees) and RA (30 knees) with a mean follow up of 9.9 years. All 30 patients had good and excellent results in terms of stability, pain reduction and knee range of motion. However, due to multiple joints involvement functional results were lower in RA patients [13]. In contrast to that our study showed that 71.4% had excellent functional outcome.

Kristensen 1992 found that 77% had good or excellent, 11% moderate and 11% poor KSS scores after 10 years follow up [3]. Our study showed that based on functional score 71.8% had excellent result, 20.5% had good result, and 7.7% had fair result.

According to Diduch et al the postoperative Knee and Function scores were 94 and 83, respectively. He studied the outcome of 103 patients of TKA having RA. Young age of subjects and no underlying disease may be the reason behind high function scores [15].

Our study showed that 71.4% had excellent outcome after TKA in patients RA. In our study knee and function score were higher than Jabalameli M, Diduch and others studies. And this is probably because short term follow up period but regardless of that our study demonstrates that significant improvement in function and relief of pain of patients with RA after total knee arthroplasty. As patients with RA continue to undergo TKR at increasing rates, it is important to have an accurate assessment of TKR outcomes so patients can be given appropriate expectations of TKR.

REFERENCES

1. Fleming A, Crown JM, Corbett M. Early rheumatoid disease. Ann Rheumatoid Dis. 1976; 35: 357-360
2. Da Silva E, Doran MF, Crowson CS, O'Fallon WM, Matteson EL. Declining use of orthopedic surgery in patients with rheumatoid arthritis? Results of a

long-term, population based assessment. Arthritis Rheum. 2003;49:216-20.
3. Kristensen O, Nafei A, Kjaersgaard-Andersen P, Hvid I, Jensen J. Long-term results of total condylar knee arthroplasty in rheumatoid arthritis. J Bone Joint Surg Br. 1992;74:803-6.
4. Chmell MJ, Scott RD. Total knee arthroplasty in patients with rheumatoid arthritis. An overview. Clin Orthop Relat Res. 1999 ;(366):54-60.
5. Lee JK, Choe CH. Total knee arthroplasty in rheumatoid arthritis. Knee Surg Relat Res. 2012; 24(1):1-6.
6. Poss R, Thornhill TS, Ewald FC, Thomas WH, Batte NJ, Sledge CB. Factors influencing the incidence and outcome of infection following total joint arthroplasty. Clin Orthop Relat Res. 1984; 182: 117–126.
7. Wilson MG, Kelley K, Thornhill TS. Infection as a complication of total knee-replacement arthroplasty: risk factors and treatment in sixty-seven cases. J Bone Joint Surg [Am]. 1990; 72: 878–883.
8. Kane RL, Saleh KJ, Wilt TJ, Bershadsky B. The Functional Outcomes of Total Knee Arthroplasty. JBJS 2005; 87(8): 1719-1723.
9. Sarokhan AJ, Scott RD, Thomas WH, Sledge CB, Ewald FC, Cloos DW. Total knee arthroplasty in juvenile rheumatoid arthritis. JBJS 1983; 65:1071-1080.
10. Seldes RM, Tan V, Duffy G, Rand JA, Lotke PA. Total knee arthroplasty for steroidinduced osteonecrosis. J Arthroplasty 1999; 14: 533-537.
11. Julio J. Jauregui, Bhaveen H. Kapadia , Anant Dixit . Thirty complications in rheumatoid patients following total knee arthroplasty. Clin Rheumatol 2016 ;35:595-600.
12. Fortin PR, Clarke AE, Joseph L, Liang MH, Tanzer M, Ferland D, et al. Outcomes of total hip and knee replacement: preoperative functional status predicts outcomes at six months after surgery. Arthritis Rheum 1999;42:1722-8.
13. Gill GS, Chan KC, Mills DM. 5 to 18 years follow up study of cemented total knee arthroplasty for patients 55 years old or younger. J Arthroplasty. 1995; 10: 598-602.
14. Jabalameli M, Rahbar M, Hadi H, Karimi Aghmioni M, Radi M. Total knee arthroplasty in rheumatoid arthritis: a mid-term study results. Shafa Ortho J. 2014.1(1):25-29.
15. Diduch DR, Insall JN, Scott WN, Scuderi GR, Font-Rodriguez D. Total knee replacement in young, active patients: long-term follow up and functional outcome. J Bone Joint Surg [Am]. 1997; 79(4): 575582.