

# Difference in Functional Recovery after Total Knee Arthroplasty between Rheumatoid and Osteoarthritic Knees

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**INTRODUCTION:** Patients suffering rheumatoid arthritis (RA) might lead to inferior recovery after total knee arthroplasty (TKA) in comparison with osteoarthritis (OA) patients. The objective of this study was to evaluate clinical outcomes including the muscle strength and function and to compare the results between RA and OA patients.

**METHODS:** In total, consecutive 441 knees (73 RA knees and 368 OA knees) were included (Table 1). In the patient demographic, the average age was older, and weight and body mass index were significantly greater in OA patients. Knee scoring was conducted using the Knee Society Score (KSS) and the new KSS (2011 KSS). For muscle strength evaluation, knee joint extension and flexion muscle strengths were measured during isometric contraction for 3 seconds in the open kinetic chain. For ambulatory function, the timed up and go (TUG) test and 10 meters walking time (10 m WT) were conducted. All measurements were performed before surgery and one year after surgery.

**RESULTS:** In the preoperative measurements, RA knees showed inferior muscle strength of knee flexion and extension, TUG, and KSS function score (Table 2). At one year after TKA, no significant differences were observed in muscle strength, ambulatory function, KSS, and 2011 KSS (Table 3). Regarding the amount of improvement in each value before and after surgery, RA knees showed greater improvement in muscle strength of knee flexion and extension, TUG, 10mWT, and KSS function score (Table 4).

**DISCUSSION AND CONCLUSION:** In RA knees, greater improvement in muscle strength and ambulatory function is expected due to lower preoperative conditions, compared to OA knees.

Table 1: Patient demographic in RA and OA knees

	RA (n = 73)	OA (n = 368)	p-value
Sex (Male/Female)	11/62	73/295	0.416
Age (years old)	65.2 (SD = 10.9)	72.9 (SD = 6.9)	<0.001
Height (cm)	151.0 (SD = 1.2)	152.6 (SD = 1.2)	0.136
Weight (kg)	57.0 (SD = 11.0)	62.2 (SD = 12.0)	<0.001
Body mass index	24.0 (SD = 4.3)	26.7 (SD = 4.3)	<0.001

SD: Standard deviation, RA: Rheumatoid arthritis, OA: Osteoarthritis

Table 2: Preoperative comparison between RA and OA knees

	RA (n = 73)	OA (n = 368)	p-value
Knee extension strength (N/kg)	0.614 (SD = 0.404)	0.829 (SD = 0.439)	<0.001
Knee flexion strength (N/kg)	0.316 (SD = 0.233)	0.481 (SD = 0.300)	<0.001
Time up and go test (seconds)	14.3 (SD = 6.6)	11.1 (SD = 5.2)	<0.001
10 m walking time (seconds)	12.9 (SD = 6.0)	10.4 (SD = 10.0)	0.070
Knee extension angle (degrees)	-7.9 (SD = 9.3)	-4.4 (SD = 8.0)	0.053
Knee flexion angle (degrees)	120.3 (SD = 18.0)	118.1 (SD = 17.9)	0.503
KSS knee score	48.6 (SD = 21.7)	45.9 (SD = 20.3)	0.319
KSS function score	46.1 (SD = 24.2)	56.2 (SD = 26.4)	0.004
2011 KSS symptoms	9.2 (SD = 5.6)	8.3 (SD = 5.6)	0.212
2011 KSS satisfaction	13.1 (SD = 6.8)	14.0 (SD = 5.7)	0.545
2011 KSS expectations	13.4 (SD = 1.3)	13.4 (SD = 2.1)	0.977
2011 KSS functional activities	39.2 (SD = 18.1)	41.1 (SD = 18.8)	0.384

SD: Standard deviation, RA: Rheumatoid arthritis, OA: Osteoarthritis

Table 3: Postoperative comparison between RA and OA knees

	RA (n = 73)	OA (n = 368)	p-value
Knee extension strength (N/kg)	1.144 (SD = 0.400)	1.185 (SD = 0.498)	0.510
Knee flexion strength (N/kg)	0.541 (SD = 0.216)	0.519 (SD = 0.227)	0.456
Time up and go test (seconds)	9.2 (SD = 4.7)	9.2 (SD = 3.9)	0.976
10 m walking time (seconds)	7.8 (SD = 3.4)	8.3 (SD = 3.4)	0.408
Knee extension angle (degrees)	-2.9 (SD = 4.3)	-2.6 (SD = 5.1)	0.570
Knee flexion angle (degrees)	119.9 (SD = 14.9)	119.4 (SD = 13.6)	0.835
KSS knee score	88.2 (SD = 13.9)	90.1 (SD = 10.0)	0.176
KSS function score	76.4 (SD = 25.6)	80.1 (SD = 18.3)	0.142
2011 KSS symptoms	19.7 (SD = 5.0)	19.6 (SD = 5.5)	0.916
2011 KSS satisfaction	25.1 (SD = 8.3)	26.3 (SD = 8.7)	0.625
2011 KSS expectations	9.9 (SD = 2.6)	9.8 (SD = 3.0)	0.860
2011 KSS functional activities	63.5 (SD = 20.1)	64.4 (SD = 21.7)	0.769

SD: Standard deviation, RA: Rheumatoid arthritis, OA: Osteoarthritis

Table 4: Comparison in improvement between RA and OA knees

	RA (n = 73)	OA (n = 368)	p-value
Knee extension strength (N/kg)	0.530 (SD = 0.400)	0.265 (SD = 0.430)	<0.001
Knee flexion strength (N/kg)	0.210 (SD = 0.232)	0.645 (SD = 0.275)	<0.001
Time up and go test (seconds)	4.9 (SD = 7.0)	2.1 (SD = 4.9)	<0.001
10 m walking time (seconds)	5.6 (SD = 6.2)	2.1 (SD = 6.9)	0.025
Knee extension angle (degrees)	4.8 (SD = 6.2)	5.7 (SD = 6.7)	0.338
Knee flexion angle (degrees)	0.3 (SD = 20.2)	1.9 (SD = 19.8)	0.542
KSS knee score	40.2 (SD = 23.0)	44.3 (SD = 21.4)	0.147
KSS function score	30.8 (SD = 26.9)	24.1 (SD = 24.0)	0.035
2011 KSS symptoms	10.6 (SD = 7.6)	11.4 (SD = 7.7)	0.416
2011 KSS satisfaction	16.7 (SD = 11.1)	15.1 (SD = 10.2)	0.287
2011 KSS expectations	3.4 (SD = 7.6)	4.0 (SD = 6.4)	0.481
2011 KSS functional activities	58.1 (SD = 19.3)	57.9 (SD = 20.9)	0.954

SD: Standard deviation, RA: Rheumatoid arthritis, OA: Osteoarthritis