

Evaluation of Functional Outcome Following Primary Total Knee Arthroplasty- A Prospective Study

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ABSTRACT

BACKGROUND

Pain, functional limitations, and impaired health related quality of life, are key concerns for individuals with advanced osteoarthritis of the knee. Total Knee Arthroplasty (TKA) is the primary treatment for patients with end stage arthritis. Despite being a common intervention associated with generally favourable outcomes,¹ a large proportion of individuals do not have expected outcomes following TKA.² So, the present study was conducted to evaluate functional outcome following primary TKA in an institute which caters to rural and semi urban population with limited financial provisions.

METHODS

This is a prospective study of 41 cases (60 knees) who underwent TKA at Rajarajeswari Medical College & Hospital, Bangalore, between November 2017 and October 2019. Cases were selected according to inclusion and exclusion criteria. Patients were evaluated using Knee Society Score at regular follow up. In our study, we had 28 female patients and 13 male patients. Indications were Osteoarthritis (OA) in 47, Rheumatoid Arthritis (RA) in 11 and Other Conditions of Arthritis (OCA) in 2 knees. The average follow-up period was 10.6 weeks.

RESULTS

In our study, pre-operatively all of our patients had moderate to severe pain, post-operatively 24 knees had no pain and 36 knees had mild pain. Pre-operative average flexion of 76° was increased to 95.8° post-operatively. All the 60 knees had poor knee score of < 60 pre-operatively, post-operatively 42 knees had excellent score (80-100) and 17 knees with good score (70-79). 38 patients had poor functional score (< 60) and 3 patients had fair functional score (60-69) pre-operatively. Post-operatively 21 patients had excellent score (80-100), 11 patients had good score (70-79), 6 patients had fair score (60-69) and 3 patients had poor score (< 60).

CONCLUSIONS

TKA is now a common and established surgical procedure. Functional outcome of the procedure is dramatic, durable, and satisfactory with high patient acceptance.

KEYWORDS

Total Knee Arthroplasty, Knee Society Score, Functional Outcome

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BACKGROUND

Knee is a complex joint and its degeneration is age related, post traumatic, and rheumatoid like arthropathies, giving rise to severe disability, severely affecting the overall health and health related quality of life. The most effective treatment for above condition is total knee arthroplasty.

40% of population above 50 years is suffering from arthritis of knee, out of which 80% need arthroplasty for pain, instability, restricted range of movement. The prevalence of rheumatoid arthritis is 0.75%; over 7 million in India are suffering from rheumatoid arthritis. With increase in the average life expectancy (69.25 years) and increased incidence of road traffic accidents the incidence of arthritis of knee secondary to age related degeneration and post trauma have also increased and number of patients undergoing TKA have also increased.

The interplay between the biomechanical studies and clinical experience has resulted in better design prosthesis that allow for near normal function. The Knee Arthroplasty has evolved as the gold standard for the treatment of debilitating arthritis. The goal of Total Knee Arthroplasty includes pain relief, improved range of motion and stability of knee joint.

TKA has been proved to offer better knee function and has been widely accepted as a standard treatment for arthritis of knee. Most of the studies have been conducted in institutes which caters to urban population without financial constraints. Our institute caters to rural and semi urban population with limited financial provisions. Hence the need of study.

METHODS

We did a prospective study on the functional outcome of 60 knees who underwent TKA using cemented posterior stabilizing design at Rajarajeswari Medical College and Hospital during the year 2017-2019. The following data was collected from patients who underwent total knee arthroplasty-

- History by verbal communication.
- Clinical examination both local and systemic
- Blood investigations like Haemoglobin, clotting time, bleeding time, blood glucose levels, renal function tests, serum uric acid, rheumatoid factor, Erythrocyte Sedimentation Rate, C- Reactive Protein, serum electrolytes.
- Pre-op instability, ROM, FFD and Extension lag were assessed using clinical and radiological evaluation viz.

Clinical Tests

- i. Varus & valgus stress test: for LCL & MCL respectively.
- ii. Anterior & posterior drawer test: for ACL & PCL respectively.
- iii. ROM and FFD were assessed clinically with a goniometer.

Radiological Evaluation

- i. Weight bearing x-rays - anteroposterior and lateral views,
- ii. Scanogram for hip-knee-ankle axis, chest x rays.

All values were compiled and assessed using knee society score.

- Photographic documentation : pre-operative, intra-operative, post-operative
- Templating data, Intraoperative data
- Pre-operative and Post-operative data Evaluation- using Knee Society Knee Score.

Indications

1. Degenerative arthritis
2. Rheumatoid arthritis
3. Post traumatic arthritis
4. Other inflammatory arthritis

Inclusion Criteria

1. Pain not resolving with analgesics
2. Age more than 50 years
3. Progressive deformities
4. Instability
5. Severe intractable pain
6. Restriction of range of motion

Exclusion Criteria

1. Age <50 years
2. Comorbid disease status like- Peripheral vascular disease, Malignancy, Uncontrolled diabetes, severe COPD, severe cardiac diseases
3. Septic arthritis
4. Neuropathic joints
5. Paralytic joints and neuro-muscular disorders
6. Severe osteoporosis
7. Severe bone defects/ deficiency
8. Poor compliant patients as in, psychiatric disorders, severe addicts

Surgical Technique

Surgery was performed under spinal with or without epidural anaesthesia. Patient was positioned supine and operating leg was positioned in flexion. A broad-spectrum antibiotic like cefoperazone, sulbactam combination of 1.5 gm IV was given before tourniquet application. A thorough betadine scrub was given. The part was painted with betadine and spirit. Sterile stockinette was used to drape the limb exposing only the operating area. Sterile drape was used for operative site.

A standard midline approach with knee in flexion was used. Deeper anteromedial dissection was followed for arthrotomy. Medial, lateral, posterior soft tissue release either minimal or extensive was done for soft tissue balancing and correction of deformities. Tibial and femoral osteophytes were excised. Femoral section was done with appropriate femoral rotation with reference to epicondylar line or Whiteside line. Tibial sectioning was done using extramedullary cutting. We have sacrificed both the cruciates in all knees. Tibial defects were managed by autologous posterior condylar grafts with screws.

The alignment and soft tissue balance was checked in extension and flexion. Trial components were assembled for proper fit and checked for soft tissue tension and balancing in flexion and extension. Patellar tracking was noticed normal in all. Cementing of components was done by using one packet of antibiotic impregnated bone cement. Tourniquet was released, hemostasis was achieved by cauterization. Wound was closed in layers. Antibiotics continued post operatively for 2 days. Standard post-operative protocol was followed to develop quadriceps, to improve the range of motion and early weight bearing ambulation. Sutures removed at the end of two weeks.

Immediate post-operative and follow-up clinical radiological evaluation was done at regular intervals. Final evaluation was done using KSS scoring system. All cases were photographically documented. The follow-up period was from 4 weeks to 17 weeks. The average follow-up period was 10.6 weeks.

Post-Operative Protocol

We employed the following post-operative protocol for patients- **Day-1:** Quadriceps strengthening exercises as permitted by the pain. **Day-3:** Active assisted flexion as tolerated by the patient and less than 90° Day-5 to 7: Ambulation was encouraged. **Day-9:** Active exercises were encouraged including extension. By the time sutures were removed (10-14 days) patients were encouraged to have good muscle strength and knee control.

RESULTS

Most of the indications in our study belongs to Osteoarthritis (47 knees) and rheumatoid Arthritis (11 knees), accounting for 96.6% of the knees. We had one patient with Psoriatic Arthritis who underwent bilateral TKA.

Indication		No. of Knees	(%)
	Osteoarthritis	47	78.3
	Rheumatoid Arthritis	11	18.3
	Psoriatic Arthritis	2	3.3
	Total	60	100
Side	Right	13	31.7
	Left	9	21.9
	Bilateral	19	46.3
	Total	41	100
Age (Years)	51 - 55	11	26.8
	56 - 60	9	21.9
	61 - 65	8	19.6
	66 - 70	9	21.9
	> 70	4	9.8
	Total	41	100
Sex	Male	13	31.7
	Female	28	68.3
	Total	41	100
Associated Conditions	Nil	10	24.3
	Hypertension & Obesity	4	9.7
	Hypertension & Asthma	2	4.8
	Hypertension & IHD	4	9.7
	Obesity, DM & Psoriasis	1	2.4
	Diabetes Mellitus	4	9.7
	Hypertension	4	9.7
	Obesity	7	17.1
	Hypertension & COPD	1	2.4
	Obesity, Hypertension & DM	1	2.4
	Hypertension & DM	3	7.3
	Total	41	100

Table 1

In our study 19 patients underwent bilateral TKA, 22 patients underwent unilateral TKA of which 13 patients to right knees and 9 patients to left knees. In our study we included patients who are above 50 years; there were 11 cases from age group 51-55 years, 9 cases from 56-60 years, 8 cases from 61-65 years, 9 cases from 66-70 years and 4 patients were above 70 years. In our study we had 68.3% of female patients and 31.7% male patients, that is 28 female and 13 male patients. In our study we had 10 patients without any associated conditions, 4 patients with Hypertension, 7 patients with obesity, 2 with DM, one patient with Psoriasis and 9 patients with multiple co-morbid conditions.

In our study Pre-operative knee society score for pain was 6.6 and post-operative score was 44.8 with a p value of <0.01, indicating significant pain relief after TKA. In our study average pre-operative range of movement was 0 to 76° of flexion and average post-operative range of movement was 0 to 95.8° of flexion with a p value of <0.01, indicating significant increase in flexion following TKA. In our study 16 knees had Anterior-Posterior instability of 5-10 mm and 44 knees without A-P instability, post operatively all the knees had <5 mm of A-P instability, with a p value of 0.003, indicating significant improvement in knee stability following TKA. In our study 12 knees had Medial-Lateral instability of 10-14 mm, 26 knees with M-L instability of 6-9 mm and 22 knees without M-L instability, post-operatively 8 knees had M-L instability of 6-9 mm and 52 knees had no M-L instability, with p value of <0.01, indicating significant improvement in knee stability following TKA. In our study we had 2 knees with FFD of >20°, 6 knees with FFD of 16-20°, 12 knees with FFD of 11-15°, 30 knees with FFD of 5-10°, post-operatively 52 knees did not have FFD, 2 knees had FFD of 11-15° and 6 knees had FFD of 5- 10°, with a p value of <0.01 which shows significant correction of FFD following TKA.

		Pre-Op	Post-Op
Pain	Nil	0	24
	Mild (Occasional)	0	10
	Mild (Stairs Only)	0	26
	Mild (Walking and Stairs)	0	0
	Moderate (Occasional)	6	0
	Moderate (Continuous)	28	0
	Severe	26	0
Range of Movement (Degrees)	40 - 60	12	0
	60 - 80	30	0
	80 - 100	16	54
	100 - 120	2	6
Anterior- Posterior Stability (mm)	< 5	44	60
	5 - 10	16	0
	> 10	0	0
Medial- Lateral Stability (mm)	< 5	22	52
	6 - 9	26	8
	10 - 14	12	0
	≥ 15	0	0
Fixed Flexion Deformity (Degrees)	None	10	52
	5 - 10	30	6
	11 - 15	12	2
	16 - 20	6	0
	> 20	2	0
Extension Lag (Degrees)	< 10	44	58
	10 - 20	14	2
	> 20	2	0

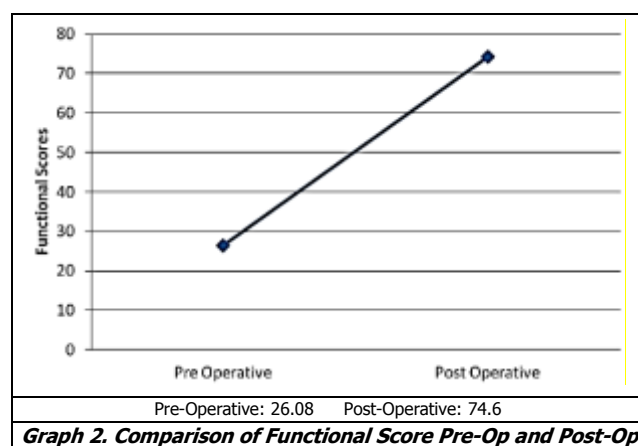
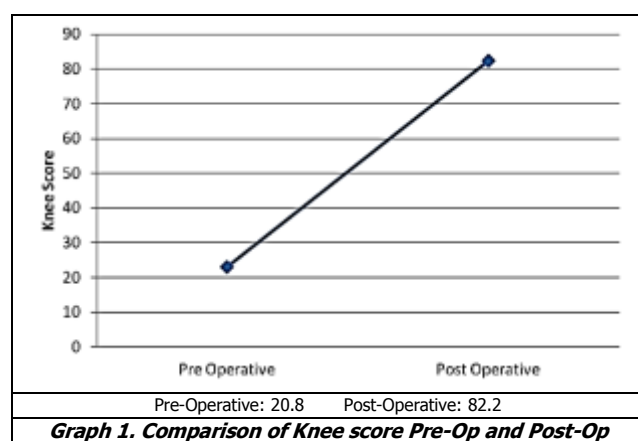
Table 2

In our study 2 knees had an extension lag of >20°, 14 knees had an extension lag of 10- 20° and 44 knees with extension lag of <10°. Post-operatively 58 knees had an

extension lag of $<10^\circ$ and 2 knees with an extension lag of 15° , with a p value of 0.003 which shows significant improvement following TKA.

		Pre-Op	Post-Op
Walking Distance	Unlimited	0	10
	> 10 blocks	0	25
	5 - 10 blocks	12	6
	< 5 blocks	21	0
	Housebound	8	0
Stairs	Unable	0	0
	Normal Up and Down	0	5
	Normal Up and Down with rail	3	17
	Up and down with rail	3	19
	Up with rail, down unable	21	0
Walking Aids	Unable	14	0
	Cane	19	6
	2 Cane	0	0
	Crutches/ Walker	8	4
	Nil	14	31
Knee Score	80 - 100 (Excellent)	0	42
	70 - 79 (Good)	0	17
	60 - 69 (Fair)	0	1
	< 60 (Poor)	60	0
	80 - 100 (Excellent)	0	21
Functional Score	70 - 79 (Good)	0	11
	60 - 69 (Fair)	3	6
	< 60 (Poor)	38	3
	OA (47 knees)	23.2	82.2
	RA (11 knees)	12.6	82.6
Knee Score in Different Indications	PA (2 knees)	11.5	79.5
	OA (47 knees)	22.5	73.1
	RA (11 knees)	25.5	72.5
	PA (2 knees)	60	90

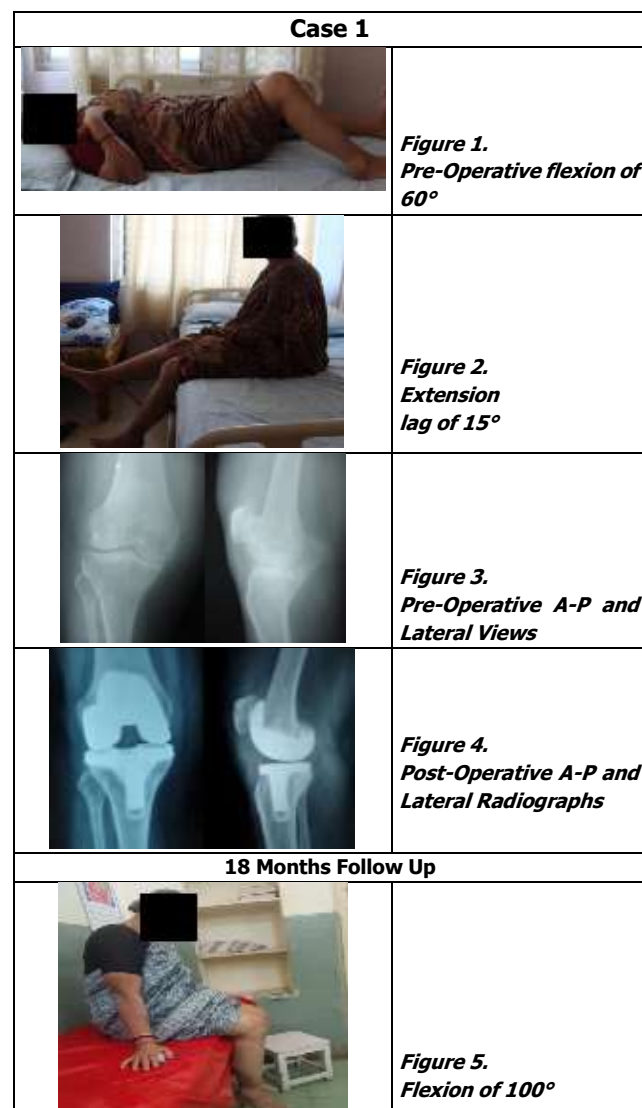
Table 3



In our study we had 2 knees with $>20^\circ$ of varus, 4 knees with $16-20^\circ$ of varus, 12 knees with varus of $11-15^\circ$, 20 knees with $5-10^\circ$ of varus, 16 knees with $0-4^\circ$ of varus, 2 knees with $16-20^\circ$ of valgus and 4 knees with $11-15^\circ$ of

valgus, post-operatively we had 56 knees with normal valgus of $5-10^\circ$ and 4 knees with residual varus of $0-4^\circ$. In our study we had 8 patients who were housebound, 21 patients who could walk <5 blocks and 12 patients with walking ability of 5-10 blocks pre-operatively. Post operatively 10 patients could walk unlimited distance, 25 patients >10 blocks and 6 patients 5- 10 blocks, with a p value of <0.01 , showing significant improvement in walking ability of patients after TKA.

In our study, pre-operative score for stairs was 9.6 and post-operative score was 35.5. Post-operatively 5 patients had normal up and down of stairs, 17 patients had normal up and down with rails and 19 patients had up and down with rails. p value is <0.01 indicating significant improvement in stair climbing ability following TKA. In our study preoperatively 19 patients were using cane and 8 patients were using walker, post-operatively 6 patients are using cane and 4 patients are using walker with a p value of 0.001 showing significant improvement. In our study, all the 60 knees had poor knee score of <60 preoperatively, postoperatively 42 knees had excellent score (80-100) and 17 knees with good score (70-79), and one knee with fair knee score (60-69), with p value of <0.01 , showing significant improvement in the knee score following TKA.



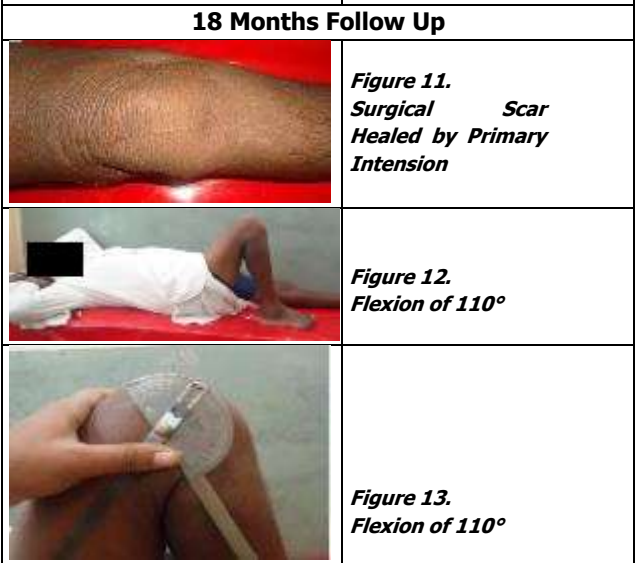
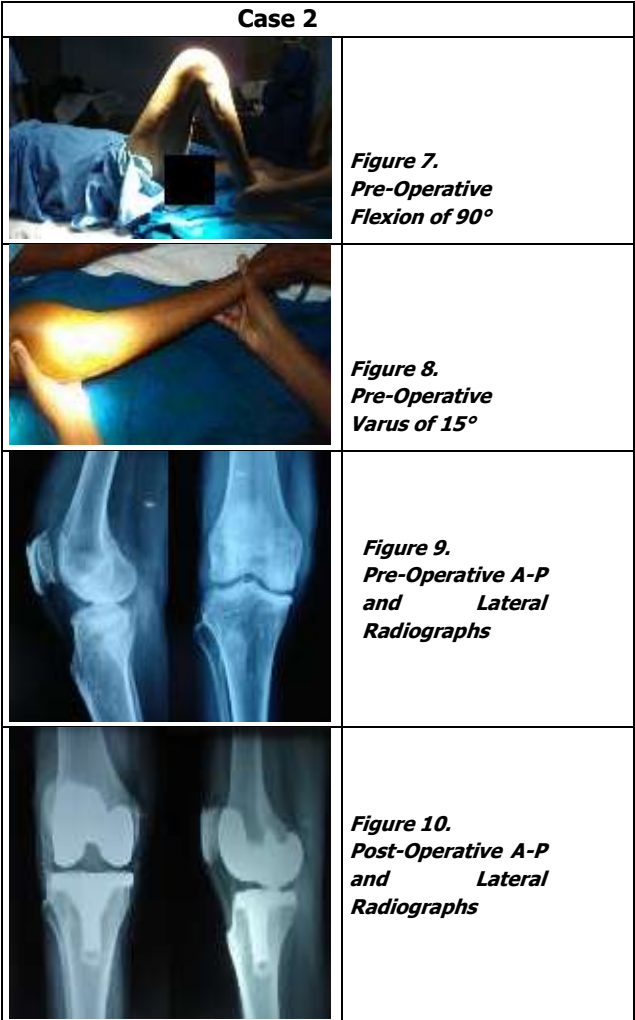




Figure 21.
No Extension Lag and
Fixed Flexion Deformity

In our study, 38 patients had poor functional score (<60) and 3 patients with fair functional Score (60-69) pre-operatively. Post-operatively 21 patients had excellent score (80-100), 11 patients with good score (70-79), 6 patients had fair score (60-69) and 3 patients poor score (<60). Preoperative mean score of 26.08 increased to 74.6 post-operatively with p value of <0.01, indicating significant improvement in functional score following TKA.

In our study post-operative knee score in Osteoarthritis knees were 82.2, in Rheumatoid Arthritis knees were 82.6 and in Psoriatic Arthritis knees were 79.5 when we compared the results of all the 3 groups, the p value was 0.569, which is not significant. In our study post-operative functional score in Osteoarthritis knees were 73.1, in Rheumatoid Arthritis knees were 72.5 and in Psoriatic Arthritis knees were 90, when we compared the results of all the 3 groups, the p value was 0.344, which is not significant.

DISCUSSION

In our study we evaluated 41 patients (60 knees) who underwent TKA. Most of the indications in our study belongs to Osteoarthritis (47 knees) and rheumatoid Arthritis (11 knees), accounting for 96.6% of the knees. We had one patient with psoriatic arthritis who underwent bilateral TKA for the same. Norman Scott reports 88(73.9%) knees OA, RA 22(18.5%), osteonecrosis 4(3.36%), traumatic arthritis 5(4.2%).³ James A. Rand et al reports OA in 68% RA 31% traumatic arthritis in less than 1%.⁴

19 patients (46.3%) underwent bilateral TKA, 13 patients to right knees (31.7%) and 9(21.9%) patients to left knees. In other studies Normann Scott reports 23.75% left, 27.5% right and 48.75% bilateral in his study³, William F. Donaldson III reports 48.1% right 28% left and 24% bilateral.⁵ We included patients who are above 50 years, there were 9 cases from age group 56-60 years, 8 cases from 61-65 years, 9 cases from 66-70 years, 11 cases from 51-55 years and 4 patients were above 70 years. Mean age in our study is 60.8 years. In other studies Ranawat et al. reports the average age of 65 years in his study.⁶ Ole Kristensen et al reports the average age of 52 years in his study.⁷ Normann Scott et al reports the average age of 66.9 years in his study.³

We had 28(68.3%) of female patients and 13(31.7%) male patients. In other studies, James A. Rand et al reports 39% males and 61% females in his study. The sex of the patients affects the cumulative rates of survival. At 5 years the rate of survival in women was 93% & 89% in men. At 10 years it was 83% in women and 76% in men.⁴ Ranawat et

al. reports 20% males and 80% females. Male survivorship at 15 years was 83.3% and in female it was 95.3%. However, he says as there was 75% female patients and less number of males the survivorship analysis with respect to sex is less reliable.⁶

We had 10 patients without any associated conditions, 4 patients with Hypertension, 7 patients with obesity, 4 with DM, one patient with Psoriasis and 15 patients with multiple comorbid conditions. Ranawat et al reports survival curves by weight revealed that clinical survivorship at 15 years in patients weighing <80 kgs was 96.2% and in patients >80 kgs it was 89.3%.⁶ 26 knees had severe pain and 34 knees had moderate pain pre-operatively, post-operatively 24 knees were pain free and 36 knees had mild pain. Our results were comparable with other studies. Arthur L Malkani et al reports 92% of the patients with moderate to severe pain on weight bearing. At 10 years follow up no pain in 70%, moderate pain in 9% of the knees.⁸ Olekristensen et al reports 94% of patients with prosthesis had less pain.⁷

Average pre-operative range of movement was 0 to 76° of flexion and average post-operative range of movement was 0 to 95.8° of flexion, with a p value of <0.01, which is significant. Results in other studies, Kelly G. Vince et al reported pre-operative mean ROM of 88° (range 45-122°) and post-operative ROM of 91.2° (range 52- 125°).⁹ BK Dhaon et al reported in varus knees average pre-operative ROM of 58.3° (range 10-90°) and average post-operative ROM of 96° (40-130°) and in valgus knees average pre-operative ROM of 43.2° (range 25-65°) and average post-operative ROM of 97.4° (80-115°).¹⁰ 16 knees had A-P instability of 5-10 mm pre-operatively, post-operatively all the 60 knees showed no A-P instability. 12 knees had M-L instability of 10-14 mm, 26 knees with M- L instability of 6-9 mm and 22 knees without M-L instability pre-operatively, post-operatively 8 knees had M-L instability of 6-9 mm and 52 knees had no M-L instability, with p value of <0.01, which is significant.

We had 2 knees with FFD of >20°, 6 knees with FFD of 16-20°, 12 knees with FFD of 11-15°, 30 knees with FFD of 5-10° pre-operatively, post-operatively 52 knees did not have FFD, 2 knees had FFD of 11-15° and 6 knees had FFD of 5-10°, with a significant p value of <0.01. Results of other studies, W. Norman Scott et al has observed 79% FFD of less than 10°, 21% had more than 10° preoperatively.³ William J Maloney et al has noted in both the TC & PSTC designs there was statistically significant improvement in flexion contracture from 12° - 2° in TC, 10°- 4° in PSTC. He observed no difference in flexion contracture correction between TC & PSTC groups.¹¹ 2 knees had an extension lag of >20°, 14 knees had an extension lag of 10-20° and 44 knees with extension lag of <10° preoperatively, post-operatively 58 knees had an extension lag of <10° and 2 knees with an extension lag of 15°, with a significant p value of 0.003.

Pre-operatively we had 2 knees with >20° of varus, 4 knees with 16-20° of varus, 12 knees with varus of 11-15°, 20 knees with 5-10° of varus, 16 knees with 0-4° of varus, 2 knees with 16-20° of valgus and 4 knees with 11-15° of

valgus, post-operatively we had 56 knees with normal valgus of 5-10° and 4 knees with residual varus of 0-4°. Douglas. A. Denis et al reports in contrast to pre-operative alignment, none of the knees after operation were excessively malaligned, with 85% in 5-9° valgus. The average post-operative knee alignment measured 5.9° (range 3-9° valgus). He agrees with Insall's belief that varus should be avoided because it has been shown to be associated with increased risk of radiolucent lines at bone cement interface & failures.¹² William F. Donaldson III et al reports that all 25 knees (100%) were in 0-10° after operation. However, in long-term follow-up evaluations of 25 knees, the alignment was neutral to 10° valgus in 23 knees (92%). One knee had less than 5° varus, one knee was in greater than 10° varus alignment.¹³

We had 8 patients who were housebound, 21 patients who could walk <5 blocks and 12 patients with walking ability of 5-10 blocks pre-operatively. Post-operatively 10 patients could walk unlimited distance, 25 patients >10 blocks and 6 patients 5-10 blocks, with significant p value of <0.01. Olekristensen et al reports that 8% could walk >500 meters pre-operatively (5 blocks) and at follow up 58% could walk more than 500 meters. 33% could walk pre-operatively 100-500 meters. 15% could walk post-operatively 100-500 meters. 60% could walk pre-operatively <100 meters. 28% could walk post-operatively <100 meters.⁷ Vitopavone et al reports that 16% could walk more than 5 blocks, 32% could walk <5 blocks, 12 patients (48%) were able to walk mainly in the house and one patient (4%) was unable to walk at follow up.¹⁴

Pre-operative score for stairs was 9.6 and post-operative score was 35.5. Post-operatively, 5 patients had normal up and down of stairs, 17 patients had normal up and down with rails and 19 patients had up and down with rails. p value is <0.01 which is significant. Vitopavone et al has observed in 25 patients study, 7 patients (28%) normal climbers, 12% had minimal difficulties, 40% moderate difficulties, 16% had severe difficulties.¹⁴ Arthur. L. Malkani reports pre-operative normal climbers 1.7% and post-operatively this was increased to 21% normal climbers.⁸

Pre-operatively 19 patients were using cane and 8 patients were using walker, post-operatively 6 patients are using cane and 4 patients are using walker with a significant p value of 0.001. In other study Arthur. L. Malkani reports that pre-operatively out of 84 patients 49 patients (58.3%) did not use walking aids whereas post-operatively at 10 years follow up 61 patients 72.6% did not use walking aids.⁸ Pre-operatively all the 60 knees had poor knee score of <60 pre-operatively. Post-operatively 42 knees had excellent score (80-100) and 17 knees with good score (70-79), with p value of <0.01, showing significant improvement in the knee score. Pre-operative mean score of 20.8 increased to 82.2 post-operatively with p value of <0.01, indicating significant improvement in functional score following TKA. Young-Hoo Kim et al reported the mean pre-operative Hospital For Special Surgery Knee Score And Knee Society Knee And Functional Scores were 42, 41 and 42 respectively

and post-operative they were 84, 90, 84 points respectively.¹⁵

In our study post-operative knee score in Osteoarthritis knees were 82.2, in Rheumatoid Arthritis knees were 82.6 and in Psoriatic Arthritis knees were 79.5. Postoperative functional score in Osteoarthritis knees were 73.1, in Rheumatoid Arthritis knees were 72.5 and in Psoriatic Arthritis knees were 90. When we compared the results between these groups, the result was statistically insignificant. This may be because the comparison groups were small. In our study no patients had any complications. MG Wilson, Kelly et al, reported incidence of infection following condylar type of knee arthroplasty is low, i. e, 0 to 3%.¹⁶ BN Stalbery et al reported Ipsilateral thrombosis in popliteal veins or thigh was seen in 11% of the patients with unilateral TKR and contralateral thrombosis was noted in 3%, bilateral TKR was associated with 58% incidence of ipsilateral deep vein thrombosis.¹⁷

CONCLUSIONS

TKA has evolved to be a good solution for multitude of knee problems. Although precise instrumentation appears to have simplified the procedure, the replacement surgeon needs to know the intricacies of the procedure to reproduce the same results as that of experienced surgeons. In other words, it has its own learning curve. One must always remember that TKA is the beginning of the problem to a surgeon and not the end. He must be fully aware of all the problems associated with the procedure including his readiness for revision arthroplasty. The problems of knees in young individuals are the real challenge to the procedure. Despite the shortcomings in technique and technology, our study series demonstrates that total knee replacement is reliable, provides pain relief, improves range of motion and gives good function. Although we have 80-90% good to excellent early results, our long term survivorship results need to be observed.

REFERENCES

- [1] Jones CA, Pohar S. Health-related quality of life after total joint arthroplasty: a scoping review. *Clin Geriatr Med* 2012;28(3):395-429.
- [2] Dunbar MJ, Richardson G, Robertsson O. I can't get no satisfaction after my total knee replacement: rhymes and reasons. *Bone Joint J* 2013;95-B(11 Suppl A):148-152.
- [3] Scott WN, Rubinstein M, Scuderi G. Results after knee replacement with a posterior cruciate- substituting prosthesis. *J Bone Joint Surg Am* 1988;70(8):1163-1173.
- [4] Rand JA, Ilstrup DM. Survivorship analysis of total knee arthroplasty. Cumulative rates of survival of 9200 total knee arthroplasties. *J Bone Joint Surg Am* 1991;73(3):397-409.

- [5] Tew M, Forster IW. Effect of knee replacement on flexion deformity. *J Bone Joint Surg Br* 1987;69(3):395-399.
- [6] Ranawat CS1, Flynn WF Jr, Saddler S, et al. Long-term results of the total condylar knee arthroplasty. A 15-year survivorship study. *Clin Orthop Relat Res* 1993;(286):94-102.
- [7] Kirstensen O. Long term results of TCK arthroplasty in RA. *J Bone Joint Surg* 1992;74B:803.
- [8] Malkani AL, Rand JA, Bryan RS, et al. Total knee arthroplasty with the kinematic condylar prosthesis. A ten-year follow-up study. *J Bone Joint Surg Am* 1995;77(3):423-431.
- [9] Vince KG, Insall JN, Kelly MA. The total condylar prosthesis 10 to 12 years of a cemented knee replacement. *J Bone Joint Surg Br* 1989;71-B(5):793-797.
- [10] Dhaon BK, Upadhyay A, Jain V, et al. Clinical and radiological results of the PCL substituting prosthesis. *Indian Journal of Orthopaedics* 2003;37(3):2.
- [11] Maloney WJ, Schurman DJ. The effects of implant design on range of motion after total knee arthroplasty. Total condylar versus posterior stabilized total condylar designs. *Clin Orthop Relat Res* 1992;278:147-152.
- [12] Dennis DA, Clayton ML, O'Donnell S, et al. Posterior cruciate condylar total knee arthroplasty. Average 11-year follow-up evaluation. *Clin Orthop Relat Res* 1992;281:168-176.
- [13] Donaldson WF, Insall JN, Ranawat CS, et al. Total condylar III knee prosthesis. Long term follow up study. *Clin Orthop Relat Res* 1988;226:21-28.
- [14] Pavone V, Boettner F, Fickert S, et al. Total condylar knee arthroplasty: a long-term follow-up. *Clin Orthop Relat Res* 2001;388:18-25.
- [15] Kim YH, Kim JS. Does TKR improve functional outcome and range of motion in patients with stiff knee? *Clin Orthop Relat Res* 2007;467(5):1348-1354.
- [16] Wilson MG, Kelley K, Thornhill TS. Infections as a complication of total knee replacement arthroplasty. Risk factors and treatment in sixty-seven cases. *J Bone Joint Surg Am* 1990;72(6):878-883.
- [17] Stulberg BN, Insall JN, Williams GW, et al. Deep-vein thrombosis following total knee replacement. An analysis of six hundred and thirty-eight arthroplasties. *J Bone Joint Surg Am* 1984;66(2):194-201.