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Functional outcome of bilateral total knee replacement arthroplasty in bilateral tricompartmental osteoarthritis of knee

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Abstract

Background & Objectives: Total knee arthroplasty is a well documented surgical procedure. It relieves pain and functional disability experienced by patients with moderate to severe arthritis of the knee, improving their quality of life. The success of Total knee Replacement arthroplasty is its ability to relieve the pain associated with knee joint pathology, while maintaining the mobility and stability of the knee joint. The most common condition for which total knee arthroplasty is done is severe osteoarthritis of the knee. The primary indication for this procedure is severe pain and the limitation in activities of daily living that it causes. To warrant doing total knee replacement, pain must be refractory to conservative measures such as oral nonsteroidal anti-inflammatory medication, weight reduction, activity restriction, and the use of supports such as a cane.

The purpose of this study was to evaluate the clinical and functional outcomes of Total knee Replacement using Knee society score and radiological assessment.

Methods: The study was carried out on 30 patients of Total knee Replacement operated in the Department of Orthopedics. Information on the patients was compiled from clinical details, case files and operation theater records. This was a prospective study. Patient follow up was for a minimum of 6 months to a maximum of 24 months (2 years).

Results: Excellent or good pain relief and function were obtained in 29 patients after TKR, which was performed in a population of active patients. The mean total pre-operative score was poor (<60) in 58 patients, which improved post operatively to a mean score of 85-100 (59 patients). There was no complication noted in our study.

Conclusion: Our study suggests that the current generation implants can provide satisfactory clinical and radiographic outcomes after an intermediate duration of follow-up. The study was free of complications, the overall functional and clinical outcome showed excellent results.

Keywords: osteoarthritis knee, total knee replacement (TKR)

Introduction

Total knee replacement is highly efficacious operation to substitute for kinematic and dynamic function of human knee against advanced arthritis.

Osteoarthritis (OA) is joint failure, a disease of multifactorial etiology in which all structures of the joint have undergone pathologic changes which is characterized by degenerative changes in articular cartilage, loss of articular cartilage, hypertrophy of bone at the margins, subchondral sclerosis, subsequent new bone formation (Osteophytes) at articular margin and a range of biochemical and morphological alterations of the synovial membrane and joint capsule. The prevalence of OA rises strikingly with age. OA is uncommon in adults under age 40 and highly prevalent in those over age 60. Most cases of osteoarthritis have no known cause and are referred to as primary osteoarthritis. It can present as localized, generalized, or erosive osteoarthritis. Secondary osteoarthritis is caused by another disease or condition such as trauma, malunited fractures around knee joint or articular surface destruction due to infection.

Primary OA of knee is more common as compared to other joints and it is the second most common rheumatologic problem and it is the most frequent joint disease with a prevalence of 22% to 39% in India. Osteoarthritis of knee joint OA is more common in women than men and the prevalence increase dramatically with age.

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Nearly, 45% of women over the age of 65 years have symptoms while radiological evidence is found in 70% of those over 65 years. OA of the knee is a major cause of mobility impairment, particularly among females. OA was estimated to be the 10th leading cause of nonfatal burden.

Whereas joint injury (bony or soft tissue) usually affects one joint alone, there are many reasons why knee osteoarthritis would tend to progress to bilateral disease. Genetic influences and inherent mal-alignment would be expected to lead to bilateral disease. A recent gait analysis study found abnormal loading in the unaffected knee of patients with unilateral knee osteoarthritis, implying that patients with a painful joint may accelerate disease in opposite joint due to changes in gait.

The various predisposing factors of secondary OA are trauma, obesity, articular surface destruction due to infection, subchondral necrosis of bone, malunited fractures and malalignment of knee joint.

There are two primary modalities for the management of osteoarthritis of knee joint: Conservative and surgical management. While surgical management is usually reserved for end stage disease, conservative management has a role to play in early stages of disease.

Total knee arthroplasty (TKA) has become a highly successful joint reconstruction procedure. Surgical outcomes, patient satisfaction, and implant survival have improved steadily since its inception. This operation has become widely accepted to afford relief of pain, 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. The demand for total knee arthroplasty is expected to rise substantially over the next years given an increasing arthritis awareness and highly successful operative procedure.

In the current study thirty patients with severe bilateral OA knee were selected after proper preoperative evaluation and underwent knee arthroplasty and all the patients were evaluated at 1 month, 4 months, 6 months, 1 year and thereafter yearly post operatively. The outcome was measured by calculating Pre-operative and post-operative knee society score. Along with knee society score complication profile of every patient was also taken into consideration.

Objectives of Study

- This study was taken up with the following aims:
 1. To assess the improvement in-
 1. Pain relief post-operatively
 2. Stability and mobility of the joint
 3. To assess the correction of deformities
 - To assess the complications associated with Total Knee Replacement

Methodology

Study Design

The study was carried out on 30 patients with bilateral OA knee joints were operated in the Department of Orthopedics, Tertiary Hospital Surat. Information on the patients was compiled from clinical details, case files and operation theatre records. This was a prospective study. Patient follow up was for a minimum of 6 months to a maximum of 24 months (2 years).

The following Inclusion/ Exclusion criteria were used for recruitment of patients in the study.

Inclusion Criteria

1. Patients with bilateral tricompartmental osteoarthritis of

knee

2. Patients willing to give consent for surgery
3. in skeletally matured patients

Exclusion Criteria

1. Secondary osteoarthritis of knee
2. Patients less than 50 years of age
3. Patients not willing to give written informed consent

Study Procedures

Patient Data

30 patients were available for the follow-up with their previous operative records, annual X-ray films and follow-up papers.

All patients underwent a standard clinical and laboratory evaluation that includes briefly information about age, sex, address, clinical history and routine investigation which were done pre operatively. X-Ray of knee joints with standing AP & lateral views were done. Information on the patients was also compiled from clinical details, Case files and Operation theatre records. Pre-op ROM, deformities and its values were recorded for the study by clinical evaluation or from the hospital case sheets and discharge summaries.

Pre- Operative Planning

Clinical assessment

Detailed history and proper clinical examination were essential to find out: Duration of illness, sensory motor examination, vascularity of limb, ambulatory status of the patient, deformities of the knee, ROM of the knee and status of the other joints.

The deformity and ROM were measured with goniometer. All the patients were assessed using Knee society Score.

Radiological assessment

Scannogram of both lower limbs was taken for all patients. It was evaluated for-

- Degree of Varus deformity
- Grading of Arthritis
- Bone stock of femur and tibia
- osteophyte formation
- need for bone grafting
- Size of the femoral canal

We used an AP standing X-ray of knee, a lateral view. A long leg standing AP view was helpful in determining mechanical axis of the limb especially that of femur because the valgus angle of the distal femoral cut is determined by the angle between the mechanical and anatomical axis of the femur. Number of compartments involved, alignment of knee joint, joint space, bony defect, loose bodies, osteophytes, status of medullary canal were noted.

Surgical Technique

In our study we have used the Median Parapatellar approach for Knee joint.

Postoperative Protocol

Postoperatively intravenous 3rd generation cephalosporin (cefoperazone + sulbactam 1.5g) each twice a day was continued for 6 days. Intravenous teicoplanin 400 mg once a day for first 3 days was given. Intravenous Amikacin (500mg) TDS was also given. Appropriate analgesia through Epidural catheter was administered for first 48 hours after which the epidural catheter was removed. Thromboprophylaxis in a

form of oral factor X inhibitor (rivaroxaban 10 mg) was given for 15 days. Negative suction drain was removed 48 hours after surgery, when the first dressing was performed. After initial six days if the dressing was dry the patient was put on oral antibiotics, usually 2nd generation cephalosporin (Cefuroxime axetil 500mg bid). Sutures were removed on 12th to 15th day after surgery.

Postoperative Physiotherapy and Mobilization

Postoperative physiotherapy involves the following steps:

1. Quadriceps strengthening
2. Knee bending
3. Walker
4. Stick
5. Toilet training
6. Stair climbing.

Static and dynamic quadriceps exercises were continued from the first day of surgery. Drain was removed after 48 hours of surgery and after that patient was made to sit up with legs by side of the bed, dangling the legs over the side of the bed was used to promote flexion and also encourage ankle pumps and passive knee extension exercises to prevent DVT.

Continuous passive mobilization (CPM) was initially started upto 30 degree and gradually increased upto 90 degree of knee flexion. Walker-aided walking was advised for initial 3 weeks. The patient was graduated to a stick after 3 to 4 weeks. Toilet training using a high toilet seat was usually achieved by the 3rd or 4th postoperative day. Stair climbing was started after 3 to 4 weeks.

Follow Up

Patients were followed up at 1 month, 4 months, 6 months, 1 year and thereafter yearly post operatively.

At Each Follow Up & On Final Follow Up

Patients were assessed using Knee Society Clinical and Radiological scoring system. Status of operative wound was also noted.

Results

The detailed analytical observation of 30 patients in whom 78965 both total knee arthroplasty was done for advanced tricompartmental osteoarthritis, conducted in the Department of Orthopaedics, tertiary care Hospital and Medical College, Surat is as follows-

Age distribution

This study was conducted on patients with age ranging from 41 to 85 years with a mean age of 63.52 years at the time of surgery. The data showed that most common age group was 51-60 years. About 43.29% of patients came under this age group

Gender Distribution

Nine patients (30%) were male and twenty-one patients (70%) were female. Male female ratio in our series was approximately 1:2

Occupation

The patients belonged to varied groups of occupation in which the amount of the activity ranged from being physically inactive 8 (retired personals), some physically active 20 (housewives) and to being physically active 2 (professional workers, clerk, farmer

Side Affected

Seven patients were having severe arthritis on right side and nine on left side.

14 patients had bilaterally equal arthritis on both sides.

Comorbid Condition

About 36.63% of patients were suffering from hypertension and about 29.97% of patients were suffering from diabetes mellitus in this study group. Five patients were suffering from both hypertension and diabetes mellitus.

Range of Motion

In our study 67% of patients had range of motion below 810 preoperatively and 33% of patients had range of motion between 81 to 900.

Pain

In our study 98% of patients had moderate to severe pain preoperatively and 2% of patients had mild pain preoperatively.

Instability

In our study preoperatively 91% of patients had 5-10mm of instability.

Flexion Deformity

In our study preoperatively 1 patient had flexion deformity (6-10 degree).

Extensor Lag

In our study preoperatively 12% of patients had significant extension lag.

Varus deformity

In our study 8% of patients had significant varus deformity and 92% of patients had varus deformity below 11°.

Preoperative Function

None of the patients in this study could climb unlimited; neither could anyone climb up and down normally preoperatively. Walking aids were used by 33% patients preoperatively.

Loose Body, Bony defects & Osteophytes

In our study loose bodies were present in knee joint in 6% of patients, none of them had bony defects and but all patients had Osteophytes.

Alignment (Pre-Op)

In our study 8.33% of patients had significant varus (110-150) involvement of knee and 91.33% of patients had 10 degree or less varus involvement of knee.

Blood Transfusion

In our study 86% of patients were transfused 1 unit of blood during hospital stay.

Prosthesis

Posterior cruciate ligament (PCL) substituting prosthesis was used in all the patients in this series. In our study 2 sized prosthesis was the most common size of both femoral and tibial component and most common size of tibial insert was 12.5mm size. In our study we have done patellar resurfacing in 10% of patients.

Complications

There were no complications noted in this study intraoperatively, postoperatively or at final follow up.

Follow up

In our study 66% of patients had no pain and 34% of patients had mild or occasional pain at final follow up.

Support Used: All the patients in our study walked unsupported without walking aids at final follow up.

Post-Op Rom

The average range of motion was 117.12° (Range 85 to 125°).

Stability: All knees were stable (<5mm) at final follow up.

Flexion Deformity: In our study not a single patient had significant flexion deformity at final follow up.

Extensor Lag: No patient had extensor lag at final follow up.

Alignment: All Knees at final follow up had good alignment.

Function: Thirty four percent of patients at final follow up could walk unlimited and sixty four percent could walk up and down normally. Sixty four percent of patients at final follow up could walk 10-20 blocks comfortably without pain. All the patients could walk comfortably without walking aids at final follow up.

Alignment: Average α angle was 94.84°, Average β angle was 89.4°, Average Valgus (Ω) angle was 4.24°, Average Femoral flexion (γ) angle was 6.08°, Average Tibial Angle (δ) was 89.06°

Implant/Bone Surface Area Coverage

All the patients in this study had adequate implant covered tibial surface.

Patellar Problem

None of the patients in whom patellar resurfacing was done had any problem.

Knee Society Clinical Score

Our average clinical knee score increased from 30.60 preoperatively to 92.24 on final follow up. Our average functional knee score increased from 44.1 preoperatively to 91.06 on final follow up. We could achieve 98% excellent result and 2% good result in this study group.

Analysis

Postoperative PAIN compared to the Preoperative Pain in tricompartmental osteoarthritis of knee right side

According to statistical evaluation as per chi square test, the pain postoperatively has significantly reduced as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee Right Side.

Postoperative PAIN compared to the Preoperative Pain in tricompartmental osteoarthritis of knee left side

According to statistical evaluation as per chi square test, the pain postoperatively has significantly reduced as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee Left Side.

Postoperative stability and mobility of knee joint as compared to the Preoperative stability in tri-compartmental osteoarthritis of knee right side

According to statistical evaluation as per chi square test, the instability postoperatively has significantly reduced as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee Right

Side.

Postoperative stability and mobility of knee joint compared to the Preoperative stability in tri-compartmental osteoarthritis of knee left side

According to statistical evaluation as per chi square test, the instability postoperatively has significantly reduced as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee left side.

Postoperative range of motion of knee joint compared to the Preoperative range of motion in tri-compartmental osteoarthritis of knee right side

According to statistical evaluation as per chi square test, the range of motion postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee Right Side.

Postoperative range of motion knee joint compared to the Preoperative range of motion in tri-compartmental osteoarthritis of knee left side

According to statistical evaluation as per chi square test, the range of motion of knee joint postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee left side.

Postoperative clinical knee society score compared to the preoperative knee society score in tri-compartmental osteoarthritis of knee Right Side

According to statistical evaluation as per chi square test, the clinical knee society score postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee right side.

Postoperative clinical knee society score compared to the Preoperative knee society score in tri-compartmental osteoarthritis of knee left side

According to statistical evaluation as per chi square test, the clinical knee society score postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee left side.

Postoperative functional knee society score compared to Preoperative functional knee society score in tri-compartmental osteoarthritis of knee right side

According to statistical evaluation as per chi square test, the functional knee society score postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee right side.

Postoperative functional knee society score compared to Preoperative functional knee society score in tri-compartmental osteoarthritis of knee left side

According to statistical evaluation as per chi square test, the functional knee society score postoperatively has significantly improved as compared to that preoperatively after total knee replacement arthroplasty in tri-compartmental osteoarthritis of knee left side.

Discussion

"Arthroplasty or surgical reconstruction of a joint is a procedure which is under evolution since last two centuries. It came through the ages of Harold, Boyd, Campbell, Guston, Insall, Coventry and many other researchers. The biomechanics of total knee arthroplasty is different from screws and plates because it has to withstand many years of cyclic load equal to several times of total body weight. To overcome the common denominator of biomechanical weakness, many types of implants with different biomaterials, sizes, implant design, fixation technique and surgical technique have been tried. But still improvement is going on for its betterment." Normal mechanical function of Knee joint is substantially altered in osteoarthritis. The surgical treatment of such condition by Total Knee arthroplasty offers an opportunity not only to replace articular surface of the joint but also to improve the long-term mechanical function. There has been continuous evolution of Total Knee Arthroplasty over last few decades throwing up newer forms of prosthesis from cemented to uncemented form. The detailed analytical observation of 30 patients in whom both total knee arthroplasty was done for advanced tricompartmental osteoarthritis, conducted in the Department of Orthopaedics, tertiary care Hospital and Medical College, Surat is as follows.

Age

Maximum number of patients were in elderly age group. In our study about 43.29% of patients were in the age group of 51-60 years and 29.97% were in the age group of 61-70 years, which clearly indicates earlier age of onset of osteoarthritis in Indian population as compared to western population. Indian patients squat and sit cross-legged commonly. This might be one of the causes for early onset of osteoarthritis in Indian population.

Sex

The male female ratio in our study was approximately 1:2. Our ratio might be more because Indian females squat and sit cross-legged commonly during domestic chores.

Occupation

Most of our patients were occupied in some physical activity. All of them were able to carry out their routine activities of daily living and occupations without hindrance after being operated.

Indication

All the patients in this study were suffering from bilateral advanced tricompartmental osteoarthritis.

Laterality

Thirty patients were operated bilaterally, seven had severe arthritis on right side and nine on left side. This shows that bilateral equal involvement was more common than unilateral involvement in osteoarthritis of knee joint.

Associated systemic illness

83.35% of the patients in our study suffered from one or more systemic illnesses ranging from hypertension, ischemic heart disease and diabetes mellitus. Thus, Total Knee Arthroplasty, though a supramajor surgery; can be performed safely and effectively in patients with systemic diseases. Being a major surgery involving procedures like cementation and reaming, all the patients should be thoroughly investigated, evaluated

and treated for systemic illness before anesthesia and surgery. Disease like diabetes mellitus and patients on steroids require due intraoperative and postoperative care. The soft tissue handling should be meticulous to avoid infection.

Clinical assessment preoperatively

All patients in our study had osteoarthritis of knee with moderate to severe pain and decreased knee range of motion preoperatively. The average range of motion preoperatively was 73.5°. A significant flexion deformity was seen in 1.66% of cases and significant extensor lag in 12% of cases. This shows late presentation of the patients for treatment of osteoarthritis of knee joint. The average knee society clinical score preoperatively was 30.60%.

Functional assessment preoperatively

In our study 33% of the patients required some form of support to walk preoperatively. None of the patients preoperatively could walk unlimited nor could either climb the stairs up and down normally. The average functional score preoperatively was only 44.1%.

Anaesthesia

In our study 94% of the patients were operated under Spinal anaesthesia and rest 6% of the patients were operated under epidural plus spinal anaesthesia. Additional benefits of epidural anaesthesia is that it allows use of indwelling catheter for 48 to 72 hours postoperatively for pain control and fewer perioperative complications.

Blood transfusion

The average blood transfusion for each surgery was 1 unit of cross-matched blood.

Type and size of prosthesis

All cases were done using Posterior cruciate ligament substituting prosthesis. Most commonly used in this study, was a 2 sized prosthesis for femur as well as tibia. The most common insert size was 12.5 mm.

Patellar Resurfacing

Patellar resurfacing was done in only 10% of the cases. Functional and clinical score at final follow-up did not differ in cases where patella was resurfaced or not. The complications after patellar resurfacing were patellar instability, dislocation, polyethylene wear, aseptic loosening, patellar clunk syndrome and patellar fracture and these complications could lead to reoperation and hence resurfacing was done in only the needful 10% of cases. We denervated the patella by cauterization (neurectomy) and drilled multiple holes in sclerosed area to decompress the patella 46.

Cement and Cementations

We used manual mixing and cementation techniques with high viscosity cement. We had zero percentage aseptic loosening rates.

Intraoperative complications

None of our patients developed cardiopulmonary complications during surgery or anesthesia. None had either neurovascular complication or rupture of extensor mechanism or fracture.

Early Complications

None of our patients developed an arterial compromise, nerve

palsy, DVT or infection in the perioperative period. We used thromboprophylaxis in the form of factor X inhibitor (Rivaroxaban, 10 mg) for 15 days to prevent DVT.

Late complication at final follow UP

On final follow up, none of the patient in our study had infection. We could achieve zero percentage infection rates. The use of laminar air flow, prophylactic antibiotic, minimizing the number of ingress and egress of operative room personnel and adhering to strict aseptic technique led in achieving zero percentage infection rate. None of our patients developed patellofemoral complications, periprosthetic fractures or aseptic failure at final follow up.

Clinical assessment (Preoperative V/S Final follow up)

A. Pain

In our study 66% of the patients had no pain at final follow up and the rest 34% had mild pain, compared to the moderate to severe pain in all the patients preoperatively.

B. Range of motion

The average range of motion on final follow up was 117.12° (Range 85° to 125°), which increased from average preoperative value of 73.5%.

C. Flexion deformity

In our study 1 patient (1.66%) had preoperatively fixed flexion deformity but none of the patients had fixed flexion deformity of more than 10 degree at final follow up.

Extensor lag

None of the patient had an extensor lag of more than 10° on final follow up as compared to 7 knees (12%) preoperatively.

Alignment

In our study 8% of patients had varus alignment of more than

10 degrees and the rest 92% of patients had less than or equal to 10 degrees of varus alignment, preoperatively. At final follow up the entire study group had a near normal anatomical valgus alignment of knee joint of $5^{\circ} \pm 5^{\circ}$. The average postoperative valgus angle was 4.24 degrees in our study.

Functional assessment (Preoperative V/S Final follow up)

On final follow up 34 percent of the patients could walk unlimited, 64% of the patients could walk 10-20 blocks comfortably without pain and rest 2% could walk up to 5-10 blocks only. At final follow up 64% of the patients could climb the stairs up and down normally and 36% of the patients could climb up and down with hand support. This could be due to short follow up in these patients. We think that they too would improve with time and would be able to walk and climb up and down the stairs unlimitedly. We could achieve an average functional score of 91.06 at final follow up. The average functional score preoperatively was 44.10. We compared the results of our study with the following studies total knee replacement arthroplasty.

1. Evaluation of fixed-bearing arthroplasty in primary total knee replacement

Radwan MA, Tarek A Mahmoud, The Egyptian Orthopaedic Journal 2015;50:132-13747.

2. A prospective study to evaluate the efficacy of Total Knee Arthroplasty conducted at KLE's hospital and MRC Belgaum

Dr. Sayaji Vishwasrao Bhamre, IOSR Journal of Dental and Medical Sciences; July 2014: Vol-13, Issue-7<pp 14-1748.

3. Early Functional Outcome of Total Knee Arthroplasty

A Suhail, H Idham, Y Shahril. Malaysian Orthopaedic Journal; 2009: vol-3, no-249.

Comparison of present study with study no.1

| S. No. | Parameter | Present Study | Study No. 1 |
|--------|-------------------------------|--|--|
| 1 | Number of patients | 30 (60 Knees) | 14 |
| 2 | Age | mean – 60.85 years | mean – 60 years |
| 3 | Sex | male – 9 female- 21 | male – 06 female – 08 |
| 4 | Score | KSS | KSS |
| 5 | Average follow UP | 6 months | 1 year |
| 6 | Pain | Preop score: -1.3 Postop score: 44.2 | Preop score: 12.7 Postop score: 44.9 |
| 7 | Range of motion | Preop – 73.5 degrees Postop – 117.1 degrees | Preop – 94.7 degrees Postop – 115.9 degrees |
| 8 | Stability | Preop score- 18.2 Postop score- 24.68 | Preop score- 16.8 Postop score- 23.5 |
| 9 | Knee society clinical score | Preop score- 30.60 Postop score- 92.24 | Preop score- 47.2 Postop score- 90.7 |
| 10 | Knee society functional score | Preop score- 44.1 Postop score- 91.06 | Preop score- 35 Postop score- 87.5 |

Comparison of present study with study no.2

| S. No. | Parameter | Present study | Study no. 2 |
|--------|--------------------|---------------------------------|----------------------------------|
| 1 | Number of Patients | 30 (60 Knees) | 24 |
| 2 | Sex | male – 9 female- 21 | male – 08 female –16 |
| 3 | Score | KSS | KSS |
| | Follow UP Period | 6 months | 6 months and 1 year |
| 4 | FFD | Preop-1 patient Postop- none | Preop-7 patients Postop- none |
| 7 | Range of motion | Preop – 73.5 degrees | Preop – 90 degrees |

| | | Postop – 117.1 degrees | Postop – 110 degrees |
|----|-------------------------------|---|--|
| 6 | Extensor lag | Preop – 6 patients Postop- none | Preop- 5 patients Postop- none |
| 7 | Radiological evaluation | AP VIEW femoral flexion- 94.840 tibial angle- 89.40 valgus angle- 4.240 LATERAL VIEW Femoral flexion- 6.080 Tibial angle- 89.060 | AP VIEW femoral flexion- 950 tibial angle- 900 valgus angle- 4.90 LATERAL VIEW Femoral flexion- 120 Tibial angle- 87.50 |
| 9 | Knee society clinical score | Preop score- 30.60 Postop score- 92.24 | Preop score- 49 Postop score- 89 |
| 10 | Knee society functional score | Preop score- 44.1 Postop score- 91.06 | Preop score- 43 Postop score- 75 |
| 11 | Complications | None | 1 patient had lateral peroneal nerve neuropraxia. 1 patient had periprosthetic s/c femur fracture. |
| 12 | Result | 98% excellent 2% good | 81.5 % excellent 14.8 % good 3.7% fair |

Comparision of present study with study no.3

| S. No. | Parameter | Present Study | Study No. 3 |
|--------|-----------------------------|---------------|--------------------------------|
| 1 | Number of patients | 30 (60 Knees) | 60 |
| 2 | Mean age | 60.85 yrs | 63.5 yrs |
| 3 | Score | KSS | KSS |
| | Follow up period | 6 months | 1.5 year |
| 4 | Knee functional score | Postop: 91.06 | Postop: 87.10 |
| 7 | Knee society clinical score | Postop: 92.24 | Postop: 87.90 |
| 6 | Complication | None | 1 patient developed infection. |

Conclusion

The present study was aimed at evaluating the early clinical and functional outcome of total knee arthroplasty in patients with tricompartmental osteoarthritis of knee joint. These surgeries are routinely performed in our hospital with a well-equipped operation theater having a laminar air flow, under strict aseptic protocol and special care to patients. In Indian population, tricompartmental osteoarthritis is the main indication for surgery. In advance stage of osteoarthritis even in younger patients it is a good option.

Our study confirms that total knee replacement has distinct advantages which are as follow:

- Alleviation of intractable pain.
- Early resumption of ambulation and return to functional activity.
- Provide good range of motion at knee joints.
- Provide deformity correction and valgus alignment of operated knee joint.

This surgery has gradually gained popularity since its inception amongst the patient population reporting to our hospital. Total knee replacement arthroplasty provides good functional outcomes allowing patients to achieve near normal life.

To conclude, total knee replacement is a safe option for tricompartmental osteoarthritis of knee joint in the elderly with good recovery, in spite of having several co-morbidities, and it will give decades of trouble-free life.

References

1. SKS Marya, Thukral R. Knee replacement ed 2, 2011, 1-5.
2. Most E, Zayontz S, Li G *et al.* Femoral rollback after cruciate-retaining and stabilizing total knee arthroplasty, Clin Orthop Relat Res 2003;410:101.
3. Easley ME, Insall JN, Scuderi GR, Bullek DD. Primary constrained condylar knee arthroplasty for the arthritic valgus knee. Ciin Orthop 2000;380:58.

4. Insall JN. Historical development, Classification and characteristic of knee prosthesis. In insall JN, Windsor RE, Scott WN, Kelly MA, Aglietti P. Surgery of the knee. Ed2. New York, Churchill Livingstone 1993, 677-718.
5. Mihalko WM, Whiteside LA. Bone resection and ligament treatment for flexion contracture in knee arthroplasty, Clin Orthop Relat Res 2003;406:141.
6. Macintosh DL. Arthroplasty of the knee, J Bone Joint Surg 48B:179.
7. Charnley J. The reaction of bone to self-curing acrylic cement: along-term histological study in man. J Bone Joint Surg 1970;52B:340-353.
8. Moll JMH, Chesterman PJ, Andrews FM. Walldius arthroplasty of the knee; followup study of 51 operations. Annals of the Rheumatic diseases 1973, 397.
9. Freeman PA. Walldius arthroplasty: a review of 80 cases. Clin Orthop 1973;94:85-91.
10. Watson JR. Harlow Wood and R.C.J. Hill: The Shier arthroplasty of the knee. The journal of bone and joint 1976, 58-B.
11. Bullek D, Scuderi G, Insall J. The constrained condylar knee prosthesis. An alternative for the valgus knee in the elderly. In: Insall J, Scott W, Scuderi G, eds. Current Concepts in Primary and Revision Total Knee Arthroplasty. Philadelphia: Lippincott Raven Publishers 1996, 85-89.
12. Insall JN, Kelly MA. The total condylar prosthesis. Clin Orthop 1985;205:43-48.
13. Giles R, Scuderi W. Norman Scott, Gregory H. Tchejeyan: The insall legacy in total knee arthroplasty. Clinical orthopaedic and related research 2001;392:3-14.
14. Colizza W, Insall J, Scuderi G. The posterior stabilized total knee prosthesis: assessment of polyethylene damage and osteolysis after A ten-year-minimum follow- up. J Bone Joint Surg 1995;77A:1716-1720.
15. D'Lima DD, Chen PC, Colwell CW Jr: Polyethylene contact stresses, articular congruity, and knee alignment,

- Clin Orthop Relat Res 2001;392:232.
16. Hozack W, Rothman R, Booth R, Balderston R. The patellar clunk syndrome. A complication of posterior stabilized total knee arthroplasty. Clin Orthop 1989;241:203-208.
 17. Insall J, Lachiewicz P, Burstein A. The posterior stabilized condylar prosthesis: a modification of the total condylar design. Two to four year clinical experience. J Bone Joint Surg 1982;64A:1317-1323.
 18. Ranawat C, Flynn W, Saddler S, Hansraj K, Maynard M. Long term results of the total condylar knee arthroplasty. A 15-year survivorship study. Clin Orthop 1993;286:96-102.
 19. Laskin RS, Maruyama Y, Villaneuva M *et al.* Deep-dish congruent tibial component use in total knee arthroplasty: a randomized prospective study, Clin Orthop Relat Res 2000;380:36.
 20. Rosenberg AG, Verner JJ, Galante JO. Clinical results of total knee revision using the total condylar III prosthesis. Clin Orthop 1991;273:83-90.
 21. Lachiewicz PF, Falatyn SP. Clinical and radiographic results of the total condylar III and constrained condylar total knee arthroplasty. J Arthroplasty 1996;11:916-922.
 22. Donaldson WF III, Sculco TP, Insall JN, Ranawat CS. Total condylar III knee prosthesis: long-term follow-up study, Clin Orthop 1988;226:21.
 23. Insall JN, Aglietti P, Baldini A *et al.* Meniscal bearing knee replacement. Surgery of the knee. Ed3. New York, Churchill Livingstone 2001, 1717-1738.
 24. Gunston FH. Polycentric knee arthroplasty: Prosthetic simulation of normal knee movement. J Bone Joint Surg 1971;53B:272-277.
 25. Robinson RP, Wright TM, Burstein AH. Mechanical properties of polymethylmethacrylate bone cements. J Biomed Mater Res 1981;15:203.
 26. Schultz RJ, Johnston AD, Krishnamurthy S. Thermal effects of polymerization of methyl methacrylate on small tubular bones. Int Orthop 1987;11:277-282.
 27. Gioe TJ, Bowman KR. A randomized comparison of all-polyethylene and metal-backed tibial components, Clin Orthop Relat Res 2000;380:108.
 28. Aglietti P, Buzzi R, Gaudenzi A. Patellofemoral functional results and complications with the posterior stabilized total condylar knee prosthesis. J Arthroplasty 1988;3:17-25.
 29. Scuderi G, Insall J. Total knee arthroplasty. Current clinical perspectives. Clin Orthop 1992;276:26-32.
 30. Robert Miller, Fredrick Azar: Osseous structures and extraarticular structures of knee joint. Campbell 12th edition 3, 2053-2059.
 31. Freeman MAR, Swanson SAVS, Todd RC. Total replacement of knee using the Freeman/Swanson knee prosthesis. Clin Orthop 1973;94:153-170, 7(2), p 117.
 32. Matthew Abdel P, Ebastian Parratte, Nicolas Budhiparama C. The patella in total knee arthroplasty: to resurface or not is the question. Pubmed 2014, 124.
 33. Edward Habermann T, Mark Kerner. Patella resurfacing in total knee replacement: is it an option? about joints.
 34. Amis AA. Anterior cruciate ligament replacement: knee stability of the effect of implants. J Bone Joint Surg Br 1989;71:819.
 35. Mihalko WM, Krackow KA. Posterior cruciate ligament effects on the flexion space in total knee arthroplasty, Clin Orthop Relat Res 1999;360:243.
 36. Coventry MB, Upshaw JE, Riley LH *et al.* Geometric total knee arthroplasty, I conception, design, indications and surgical technic, Clin Orthop 1973;94:171.
 37. Rand JA. The patellofemoral joint in total knee arthroplasty, J Bone Joint Surg 1994;76A:612.
 38. Norwood LA, Cross MJ. Anterior cruciate ligament: functional anatomy of its bundles in rotatory instabilities. Am J Sports Med 1979;7:23.
 39. Insall J, Ranawat C, Aglietti P, Shine J. A comparison of four models of total knee replacement prostheses. J Bone Joint Surg 1976;58-A:754-765.
 40. Radwan MA, Tarek Mahmoud A. Evaluation of fixed-bearing arthroplasty in primary total knee replacement. The Egyptian Orthopaedic Journal 2015;50:132-137.
 41. Mihalko WM, Krackow KA. Differences between extramedullary, intramedullary, and computer-aided surgery tibial alignment techniques for total knee arthroplasty J Knee Surg 2006;19:33.
 42. Mihalko WM, Boyle J, Clark LD, Krackow KA. The variability of intramedullary alignment of the femoral component during total knee arthroplasty J Arthroplasty 2005;20:25.
 43. Barrack RL, Schrader T, Bertot AJ *et al.* Component rotation and anterior knee pain after total knee arthroplasty, Clin Orthop Relat Res 2001;392:46.
 44. Mihalko WM, Miller C, Krackow KA. Total knee arthroplasty ligament balancing and gap kinematics with posterior cruciate ligament retention and sacrifice, Am J Orthop (Belle Mead NJ) 2000;29:610.
 45. Insall JN, Dorr LD, Scott RD, Scott WN. Rationale of the Knee Society clinical rating system, Clin Orthop 1989;248:13.
 46. Scott RD, Reilly DT. Pros and cons of patella resurfacing in total knee replacement, Orthop Trans 1980;4:328.
 47. Radwan MA, Tarek Mahmoud A. The Egyptian Orthopaedic Journal 2015;50:132-137.
 48. Dr. Sayaji Vishwasrao Bhamre: A prospective study to evaluate the efficacy of Total Knee Arthroplasty conducted at KLE's hospital and MRC Belgaum. IOSR Journal of Dental and Medical Sciences 2014;13(7):14-17.
 49. Suhail A, Idham H, Shahril Y. Early Functional Outcome of Total Knee Arthroplasty. Malaysian Orthopaedic Journal 2009; 3(2).