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Dr. Anand Garampalli
Associate Professor, Department
of Orthopaedics, MR Medical
College, Kalaburagi, Karnataka,
India

Dr. Alok Patil
Assistant Professor, Department
of Orthopaedics, MR Medical
College, Kalaburagi, Karnataka,
India

Dr. Muzammil Quadri
Junior Resident, Department of
Orthopaedics, MR Medical
College, Kalaburagi, Karnataka,
India

Corresponding Author:
Dr. Anand Garampalli
Associate Professor, Department
of Orthopaedics, MR Medical
College, Kalaburagi, Karnataka,
India

Our experience of total knee arthroplasty in rural Karnataka region

Dr. Anand Garampalli, Dr. Alok Patil and Dr. Muzammil Quadri

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Abstract

Total knee arthroplasty is the gold standard in treatment of end-stage osteoarthritis, with excellent functional outcome, and long term pain relief. But its acceptance in the rural setting comes with its own set of challenges. This study highlights our experience in managing patients undergoing TKR in rural Karnataka. We evaluated the outcome by comparing the pre-op and post-op Knee society scores, and incidence of early infection. We selected 34 patients, belonging to rural Karnataka who underwent TKR, and gave informed consent to be a part of this study. The follow-up was of minimum 6 months. In our study, majority of patients belonged to 66-70 age group. Mean BMI was 25.68. The knee society score improved from an average pre-op score of 43.82 to an average of 84.47. The incidence of complications in our study was 9%. We found a significant increase in the KSS scores after undergoing TKR. Based on this series, we conclude that there is no significant difference in the outcomes of Total Knee Replacement, when compared with other series.

Keywords: Total knee replacement, total knee arthroplasty, knee society score, rural Karnataka

Introduction

With an increase in healthcare facilities, there is an increased population in the geriatric group. Because of that, there is an increase in incidence of knee osteoarthritis. India has an estimated prevalence for knee Osteoarthritis of 5.8%, with trends showing more in the rural population compared to the urban group.

OA is strongly associated with ageing, and heavy physical occupational activity, a required livelihood for many people living in rural communities in developing countries^[1]. The varied treatment alternatives depend on the time of presentation, which ranges from lifestyle modification, pharmacological treatment, to surgical management. As of now, Total knee arthroplasty is the gold standard in treatment of end-stage osteoarthritis, with excellent functional outcome, and long term pain relief. But Its acceptance in the rural setting comes with its own set of challenges.

The first challenge being that patient usually present to the hospital with an end-stage osteoarthritis, with severe deformity and pain, which complicates the surgery^[2]. The second challenge is the unwillingness and non-acceptance of surgical treatment. Other challenges include high cost of treatment, and very high expectations of functional outcome and pain relief. Also, there are problems in follow-up due to increased travel time to hospital, non-allopathic doctors and quacks practicing medicine in rural areas, unhygienic practices leading to increased chances of deep infection, and disbelief in modern medicine.

With respect to these unique problems, the outcome of Total Knee Arthroplasty becomes an important study in a rural, low socio-economic section.

Materials and Methods

The study was performed in 34 cases of osteoarthritis of knee who had undergone Total Knee Arthroplasty between June 2017 to June 2018 in Basaveshwara Hospital, Kalaburagi and Kamareddy Hospital, Kalaburagi. Knee society knee score was used to evaluate the clinical and functional outcome.

Inclusion criteria

Unilateral/bilateral involvement, moderate to severe knee pain, angular knee deformity, knee stiffness with decreased range of motion.

Exclusion criteria

Any active infection, revision arthroplasty, vascular problems, secondary osteoarthritis due to post-trauma or post-infection.

Procedure

Total knee arthroplasty was performed under spinal with epidural anaesthesia. The approach used was medial parapatellar approach. Tibial preparation was done with the help of extra-medullary cutting guide, and tibia cut perpendicular to the mechanical axis is made. Femoral cut was made with a 6-7 degree valgus to the predetermined mechanical axis. After that, anterior, posterior, chamfer and box cuts were made using cutting block. The implant and instrumentation set used was Zimmer NexGen LPS-Flex Fixed Bearing Knee. Soft tissue release was done in accordance with the deformity. In some cases, screws were used to augment polymethyl methacrylate for filling tibial defect. Patellar resurfacing was done in a few cases with severe tricompartmental osteoarthritis.

Post-op management

The patients were started on IV antibiotics and DVT prophylaxis in the form of subcutaneous low molecular weight heparin. Patient was immobilised in a knee extension brace for 1 day, after which passive knee ROM and complete weight bearing was initiated on 2nd day, after drain removal. Patients underwent static quadriceps strengthening exercises for first 3 days, and CPM upto 90 degrees for 5-6 days. Suture removal was done on POD 12, and follow-ups were done to monitor for any untoward complications.

Scoring system

Patients were evaluated using Knee Society Score pre-operatively, and post-operatively at 3 months.

Results

Our series comprised of 34 patients, belonging to rural Karnataka, who were operated in Basaveshwara Teaching and General Hospital. The minimum follow-up period was six months, and maximum was twenty two months. Knee society knee score was used to evaluate the patient at every follow-up.

1. Age

Age distribution	Frequency	Percentage
51 to 55	2	0.05%
56 to 60	12	35.29%
61 to 65	13	38.23%
66 to 70	5	14.70%
71 to 75	1	2.9%
75 to 80	1	2.9%
Total	34	100

Majority of patients were in the age group of 66 to 70 years (38.23%).

2. Gender

Males were more than females in our study, with a ratio of 1.83:1. Left knee was affected in 15 patients and right knee in

19 patients.

3. BMI

The range of height in the series was 151 to 165 cms, with a mean of 157.67 cms. The mean weight was 63.85 kgs, with a standard deviation of 7.14. The mean BMI was 25.68, with 18 patients having BMI greater than 25.

4. Pre-op and post-op KSS scores

Grading was done on KSS (Knee society score). A score of 80-100 signified excellent outcome, 70-79 as good, 60-69 as fair and <60 signified poor outcome.

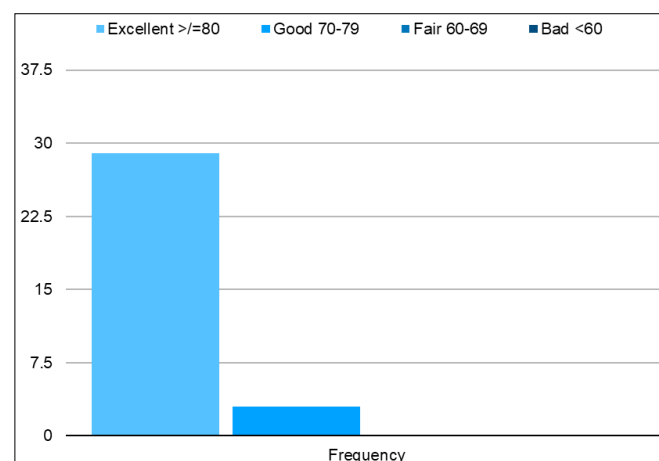
Status	Mean	Median	Range	Standard deviation
Pre-op	43.82	43	39 to 52	3.5374
Post-op	84.47	84	79 to 93	3.7028

The details of KSS pre and post-operatively are as follows:

KSS outcome	Frequency
Excellent >=80	29
Good 70-79	3
Fair 60-69	0
Bad <60	0

The KSS outcome in patients were as follows:

5. Deformity



Pre-operatively, 29 knees had a varus alignment, while 5 knees had a valgus alignment. Post-operatively, except for 4 knees, all others were aligned in varus.

6. Post-operative mobilisation

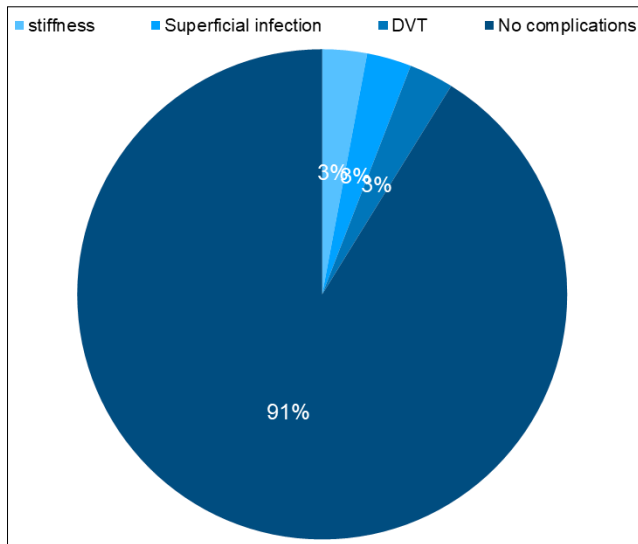
30 patients were made to completely weight bear on 2nd post-operative day, while 4 patients were made to weight bear by the end of 1 week.

7. Complications

Complications	No of patients
Stiffness	1
Superficial infection	1
DVT	1

The complications encountered in our series was stiffness, local wound complications, and thromboembolic disease (n=1).

We were limited by the short time of study, as the more severe complications take some time to manifest.



Discussion

A primary report by ISHKS between 2006 and 2012. With a data of 34,478 TKAs across India observed that 8612 males (25%) and 25,866 females (75%) underwent surgery. Average age was 64.4 years. Average body mass index was 29.1 (Range: 18.1 to 42.9) [3]. Our study had a male predominance, i.e. 64%, compared to 36% of females. The majority patients in our study was in the age group of 61-65 years, and average BMI was 25.65 with a range of 21.64 to 30.46. The BMI is important because morbidly obese patients demonstrated significantly lower implant survivorship, lower Knee Society scores, and more perioperative complications than nonobese patients [4].

Ramkumar *et al.* concluded that a single, validated, reliable, and responsive PROM addressing TKA patients priorities has not yet been identified, and a clear definition of a successful procedure remains elusive [5]. This makes it even more difficult to ascertain the results of TKA. We chose Knee Society score to evaluate the outcome, since it has both observational and functional components. In our series, there was a significant post-operative improvement in the knee society score. This was comparable to a study by Kuroda *et al.*, which concluded that all patient-derived scores improved postoperatively [6].

A study conducted by Dash *et al* concluded that TKA candidates with good preoperative walking ability and understanding of knee arthroplasty have better QoL in early and late post-surgery periods. Hence, it emphasises the importance of early operative intervention, and proper counselling in the overall outcome. This study also concluded that, some patients fail to understand the intrigues of the surgical procedure probably due to their literacy levels, social tension, old age, ignorance or cognitive and co-morbid limitations. These patients often have a poor preoperative walking ability and functional knee scores, are likely to be dissatisfied following TKA and involve less in post-surgical rehabilitation [7]. The factors associated negatively were obesity, advanced age, comorbidities, persistence of pain after the procedure and a lengthy wait for surgery [8]. Identification of such patients is of paramount importance for management of expectations from the surgery, to reduce the likelihood of patient dissatisfaction [9].

A cross-sectional study undertaken by Francis *et al* concluded that Medicare beneficiaries living in rural areas are more likely to undergo total knee or hip replacement surgeries [10].

This is contrary to the common belief that the patients belonging to rural areas are hesitant in undergoing joint replacement surgery.

Complications of TKR include periprosthetic infection, aseptic loosening, polyethylene wear, osteolysis, metallosis, instability and dislocation, and periprosthetic fracture. Ganon *et al.* after reviewing 188,251 patients found that the top 5 causes of readmission included superficial surgical site infection (SSI; 9.7%), non-SSI infection (9.5%), cardiovascular complications (CV; 9.3%), gastrointestinal complications (8.8%), and venous thromboembolisms (8.8%). The overall incidence of early complications warranting 30-days readmission was 3.19% [11]. We couldn't compare this data with the incidence in our study because of our small sample size.

Tables

Table 1: Age distribution in our series

Age distribution	Frequency	Percentage
46 to 50	2	5.8%
51 to 55	3	8.82%
56 to 60	4	11.76%
61 to 65	6	17.64%
66 to 70	13	38.23%
71 to 75	6	17.64%
Total	34	100

Table 2: Pre-operative and post-operative KSS scores

Status	Mean	Median	Range	Standard deviation
Pre-op	44.14	44	39 to 51	3.4969
Post-op	83.14	84	73 to 89	3.9785

Table 3: Grading of KSS outcome

KSS outcome	Frequency
Excellent >=80	18
Good 70-79	10
Fair 60-69	4
Bad <60	0

Table 4: Complications seen in our series

Complications	No of patients
Extensor lag	1
Stiffness	4
Superficial infection	3
DVT	2

Illustrations and figures

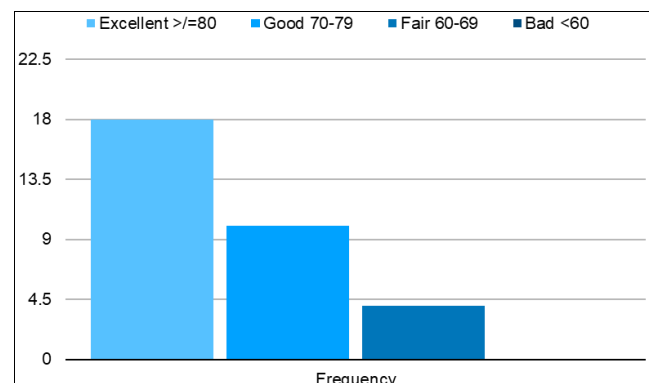


Fig 1: Frequency of patient outcome

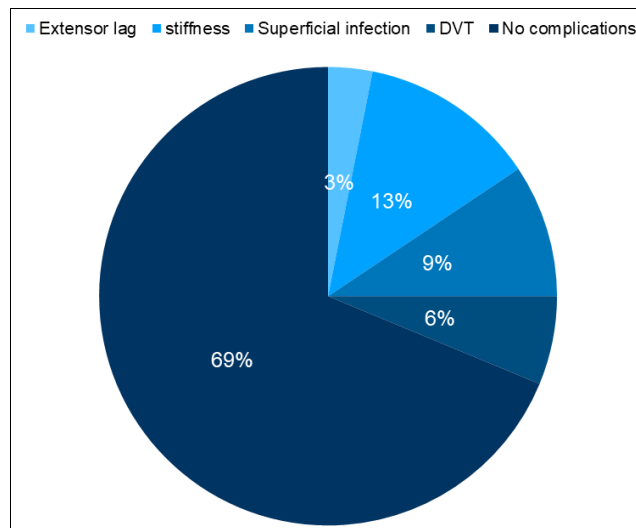


Fig 2: Post-operative complications

Case 1



Fig 3: Pre-operative severe varus deformity seen in left knee



Fig 4: Pre-operative X-ray left knee AP and lateral views standing

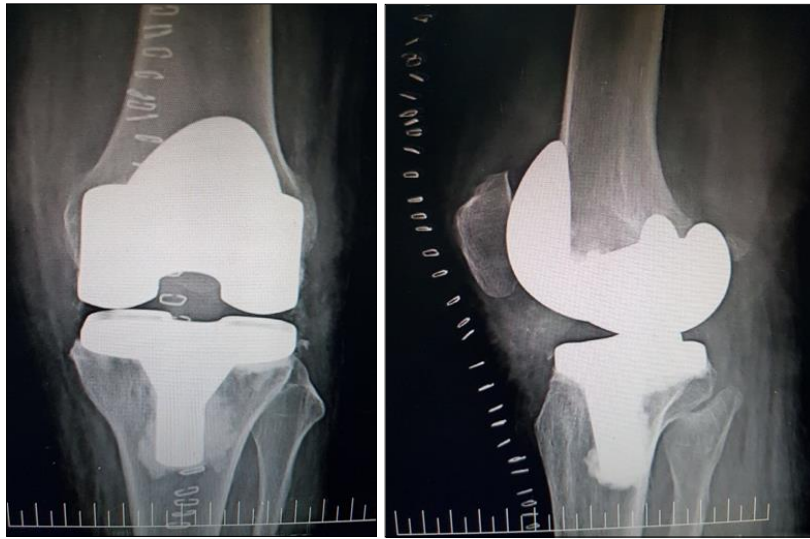


Fig 5: Post-operative standing X-ray left knee AP and lateral views standing



Fig 6: Post-operative ROM as seen on POD 13

Case 2



Fig 7: Pre-operative varus deformity over right knee



Fig 8: Pre-operative severe tricompartmental osteoarthritis in AP and lat view



Fig 9: Post-op knee range of motion

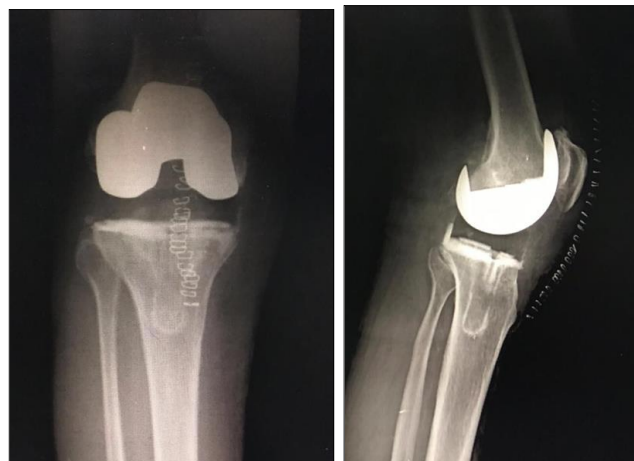


Fig 10: Post-op X-ray AP and lat view Rt knee standing

Conclusion

Based on this series, we can conclude that there is no significant difference in the outcomes of Total Knee Arthroplasty in our series, when compared with other series. However, there is a requirement of greater effort in counselling in regards to permanent change in lifestyle.

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