



RESULTS OF PRIMARY TOTAL KNEE ARTHROPLASTY AT A RURAL SET UP

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ABSTRACT Total knee arthroplasty is worldwide accepted procedure for treatment of osteoarthritis in knee joint. But this procedure is not accessible to the rural community because of lack of hospitals and very high cost of surgery. We operated 29 knee joints (18 patients) for total knee arthroplasty (13 female and 5 male) at a rural hospital. This procedure is associated with complications like infection, patellar fractures, dislocations and fat embolism, malalignment. We observed one subluxation of knee joint postoperatively. Mean knee society score was 89.3 in this study. During this study, navigation system was not used. We conclude that total knee arthroplasty in degenerative disease is safe and effective treatment even in rural set up also.

KEYWORDS : Total knee arthroplasty, Osteoarthritis, subluxation, rural set up

Introduction:

Total knee arthroplasty (TKA) is a well-proven procedure. The primary indication for total knee arthroplasty is to relieve pain caused by severe arthritis. The pain should be significant and disabling. Correction of significant deformity, patellofemoral arthritis is other indications for total knee arthroplasty.

There is significantly higher prevalence of knee pain in the rural (13.7%) compared with the urban (6.0%) community in India. Joint replacement surgery is largely inaccessible to most people in rural regions, possibly resulting in a large and growing number of older people living many years with severe joint disease. (1)

Although total knee arthroplasty usually produces excellent results, complications occur in 5% to 8% of cases because of loosening, instability, dislocation, infection or fracture.(2-4) The success of joint replacement depends on many factors, including patient selection, prosthetic design, soft-tissue balancing, the alignment of the leg and the restoration of the joint line.(5)

We have done total knee arthroplasty in 18 patients with 29 knee replacements (11 patients bilateral) at a rural hospital and evaluated our results using knee society score (6).

Fig. No. 1 preoperative and postoperative radiograph

**Material and Methods:**

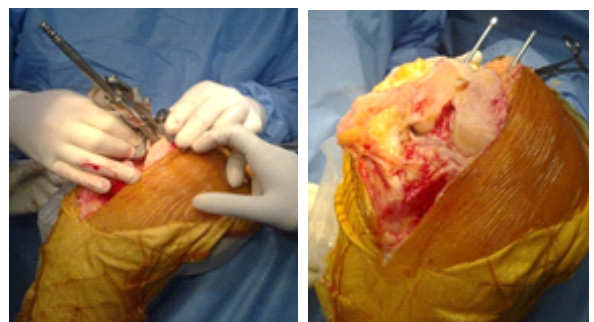
We operated 18 patients (13 female and 5 male patients) during October 2010 to January 2013 for total knee arthroplasty at Kasturba Hospital, Sevagram, India, a rural hospital. 11 patients operated bilaterally. Out of these 11 patients, 10 patients were operated in one setting and 1 in two settings.

All the patients were evaluated preoperatively. X rays of both the knee joints were taken an AP and lateral projections. Routine blood investigations were done. Patients were evaluated for rheumatoid arthritis, ankylosing spondylitis. ESR and CRP were done to rule out presence of infection. After having consent for operation and anaesthetic fitness, patients were taken to operation theatre.

Preoperatively injection Linezolid 600mg was given to every patient 30 min-1 hr before incision. Median parapatellar approach was used for operation. After proper exposure of knee joint, femoral surface was prepared using gap technique. Tibial surface prepared by cutting perpendicular to mechanical axis. Components were fixed to the cut surface of femur and tibia using Polymethyl methacrylate. Wound closed over negative suction drain. All patients were given low molecular weight heparin postoperatively and it was stopped once weight bearing was started.

After operation, knee brace was applied to the operated extremity. On postoperative day 2, bedside exercises (e.g. ankle pumps, quadriceps exercises...) began. Exercises for active ROM and terminal knee extension, gait training with assistive device were started. On postoperative day 4-7, progression of ambulation on level surfaces started and progressive increase in ambulation distance started from 3 weeks.

Fig no 2 operative steps:



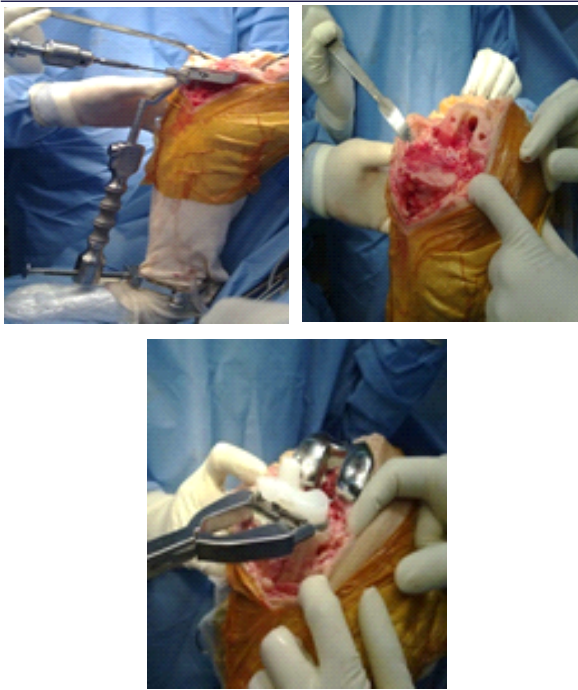
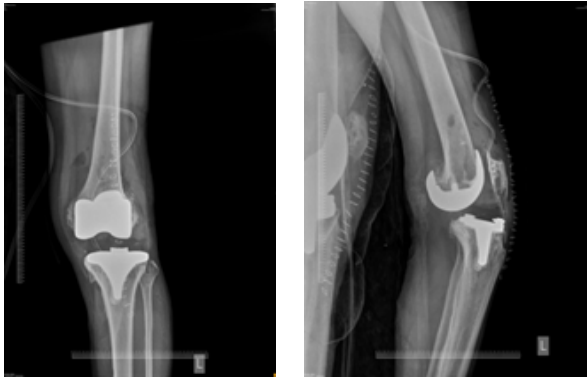


Fig no. 3 knee subluxation.



Results:

We operated 18 patients (29 knees) for total knee replacement. (11 patients bilaterally). 13 patients were female while 5 patients were male. Indication of total knee replacement was posttraumatic arthritis in 2 knees while osteoarthritis in remaining 27 knees. Mean age of the patients in this study was 59 years with minimum 45 years to maximum 80 years.

Out of 11 patients who were operated bilaterally, 10 patients were operated in one setting. Mean duration of follow up was 13 months (2-26 month). 2 patients had follow up of 2 months as they were operated in latter part of study. Remaining all patients had follow up more than 6 months.

Assessment:

Assessment was done using knee society score (5), which takes into account pain, range of motion and stability and deductions for flexion contracture, extension lag and malalignment. Mean knee society score in our study was 89.3 (75-96).

We took radiograph at the final follow up. We found no dislocation, subluxation or malpositioning or aseptic loosening.

In our study, one patient had range of motion of 90 degrees for flexion postoperatively. This patient was treated with closed manipulation under anaesthesia at 6 month of postop. and given CPM exercises. At the final follow up the range of motion increased to 110 degrees.

We had one complication in our study. One of the patients had posterior subluxation of knee immediate postoperatively. This patient was treated with closed reduction on same day.

Discussion:

Total knee arthroplasty is one of the most common orthopaedic procedures performed. Previous reports suggest that TKAs improve functional status, relieve pain, and result in relatively low perioperative morbidity (7). Osteoarthritis was the main indication for total knee replacement in our study. Tricompartmental replacement is most suitable for patients with primary osteoarthritis, osteonecrosis, or rheumatoid arthritis provided they have an acceptable range of motion (greater than 45 degrees) (4).

We have performed these surgeries at a rural hospital. From an individual viewpoint, symptomatic OA is associated with chronic pain and increasing difficulty performing the usual daily activities necessary to maintain independence. From a socioeconomic viewpoint, OA is costly, having high direct costs in the form of increased utilization of hospital and medical services, and also high indirect costs through lost productivity of individuals and their carers. (1). We have provided total knee arthroplasty with low cost to the patients. We cut the prices of prosthesis and hospital charges for patients to enable them to bear the decreased cost for surgery.

We had one complication during this study. One of the patients had subluxation of knee immediate postoperatively which was treated with closed reduction on same day. Patient was given posterior slab in postoperative period for 3 weeks and weight bearing was started after 3 weeks. After a follow up of 6 months, we didn't notice any subluxation or dislocation in same patient. Patient had mild pain and limitation of knee flexion.

The primary factors believed to cause TKA failures (and thus require consideration for TKA revision—TKAR) include trauma, chronic progressive joint disease, prosthetic loosening, and infection of the prosthetic joint (8). Major patellar complications, such as patellar dislocation or fracture, have been reported in 1% to 12% of recent total knee arthroplasty cases and continue to be one of the leading causes of revision total knee arthroplasty (9,10,11). In our study, we didn't observe fracture or dislocation of patella.

Hanssen and colleagues documented a 2.5% infection rate for 18,749 total knee arthroplasties performed at the Mayo Clinic between 1969 and 1996 (12). Johnson and Bannister found a superficial infection rate of 4.9% and a deep infection rate of 5.3% after reviewing 471 arthroplasties (13). We didn't observe any infection in our patients. This may be because of proper selection of patients, preoperative dosage of antibiotic and antibiotic coverage postoperatively along with proper wound care.

We operated 10 patients with bilateral knee osteoarthritis in one setting. This reduces the cost for operation and duration of hospital stay. Morrey et al., Ritter et al. and Soudry et al have shown that one stage procedure is functionally effective and safe. (14,15,16). Barrett et al. found that the adjusted risk of pulmonary embolism is about 80% higher in the 3 months after a simultaneous procedure than in the 3 months after a single procedure (17). In our study we didn't face complication of fat embolism in any patient. We administered low molecular weight heparin to every patient postoperatively till weight bearing.

We didn't use navigation system in any patient. The specific problem for the clinician is that navigation systems depend on mathematical algorithms. The exact charting of landmarks is not possible with complete certainty, which raises the question as to whether slight errors which occur intraoperatively due to the subjective perceptions of the surgeon, can lead to major errors in measurement when using the navigational system. The rate of wound healing and early infection suggests that the navigation-guided procedures cause more trauma to the soft tissues because the incision required for fixation of the rigid bodies is 4 cm longer than that used for access in conventional TKAs (18).

Mean Knee society score in our study was 89.3 (range 75-96). We used knee society score for evaluation of results in our study as increasing age or a medical condition does not affect the knee score (6). Our results are comparable with the other studies using knee society score for evaluation of results. Amin et al, found mean knee score 85.7 and 90.5 in obese and nonobese patients respectively (19). Li et al, had mean KSS of 87 in their study (20).

Our study has few shortcomings. The period of follow up in our study is small. Also the number of patients operated is less.

Thus, from our results we conclude that total knee arthroplasty is a good treatment for pain relief and restoration of function in patients with advanced degenerative disease and also cost effective for rural population in our hospital.

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