Original Research Article

Functional and radiological outcome of total knee replacement in varus deformity of the knee

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A B S T R A C T

To evaluate clinical radiological and functional outcome of total knee arthroplasty in varus deformity of more than Fifteen degrees. Twenty Knees in Fifteen patients with varus deformity exceeding Fifteen degrees were prospectively evaluated using selective postero-medial release with preservation of medial collateral ligament integrity. Mean varus angle of 18 degrees pre operatively was corrected to 6 degrees valgus post operatively. 80% of the knees were in 4-10 degrees of valgus post operatively. Mean knee society score improved from 29.45 to 84 and function score from 26.5 to 79.5 respectively. 12 knees which had lateral instability pre operatively reported no significant instability on follow up. 9 patients who had flexion contracture pre op with an average Fixed flexion deformity of 15 degrees showed good range of movements in the post operative follow up. Correction of severe varus deformity by using selective postero medial release with preservation of medial collateral ligament integrity in total knee replacement can successfully restore alignment, pain free movement and stability.

Introduction

Knee replacement surgery is one of the most successful surgeries in orthopedics. Hundreds of thousands of these operations are now carried out every year worldwide with excellent results. Knee replacement becomes necessary when the knee joint has been damaged from any cause and the resulting pain cannot be satisfactorily be controlled by other means. The usual problem that can end up in the need for total knee replacement is chronic arthritis. In this article we are going to assess functional and radiological outcome of total knee replacement in the varus deformity of the knee.

Materials and Methods

Prospective study of twenty Knees in fifteen patients with varus deformity exceeding fifteen degrees was done at Sri Ramachandra medical center. The study period was January 2011 to October 2014. Follow-up period was 6months to 3years, with an average follow-up of 22months. Age groups of 40-80 years were included, with a mean age group of 59.66years. There were 5 male and 10 female patients in the study. The indications were primary osteoarthritis (16) and rheumatoid arthritis (4). Patients with post-traumatic secondary arthritis and extra-articular deformity were excluded from the study.

All surgeries were done with midline incision through a medial para patellar approach. Informed consent was obtained from patients after discussion of the advantages and risk involved with the procedure.

We used the Knee society score for clinical and functional evaluation and plain X-ray of the involved knee – AP view (standing), lateral view (in 90 deg flexion), skyline view and long leg AP view for radiological evaluation. We used semi-constrained, cemented total knee prosthesis with 4 PCL retaining and 16 PCL sacrificing prosthesis. Patella re-surfacing was done in 6 knees.

Results and Discussion

In our series, all patients had good pain relief compared to their pre-operative status. The average pre-operative pain score was 6, which was reduced to 1 and no pain respectively. Mean varus angle of 18 degrees pre-operatively was corrected to 6 degrees valgus post operatively. 80% of the knees were in 4-10 degrees of valgus post-operatively. 9 patients who had flexion

contracture pre op with an average fixed flexion deformity of 15 degrees showed good range of movements in the post operative follow up. The average pre-operative knee ROM was 86.59 degrees, which improved 97.5 degrees post-operatively. There was an average increase in ROM of 11 degrees post-operatively. 12 knees which had lateral instability pre operatively, 7 knees had 5-10mm opening laterally. 5 patients had grade-1, 7 patients had grade-2 and 8 patients with no varus instability. These patients reported no significant instability on follow up. The mean pre-operative knee society score i.e. knee and function scores were 29.45(range: 15-52) and 26.50(range: 10-40) respectively. The scores improved to 84(range: 60-92) and 79.5(range: 70-90) respectively.

Our study was compared with a similar study done by Bentley G, Zamora J, Li PL(JBJS 2002 JUL). The limitation was that, the study by Bentley et al was a long term study with higher case numbers. The total number of cases in our study were 15(20 knees), whereas it was 102 in the comparative study.

Table.1 Total knee arthroplasty : short term follow-up

Year	1996-2002	Our Study
No. of cases	**102**	**20**
Follow-up	**6.5yrs**	**3.2 yrs**
Indication OA:RA	**15:2**	**4:1**
Age	**65.2yrs**	**59.66yrs**
prosthesis	**PCL retaining**	**PCL retaining/ substituting**
Knee score (gain)	**42.94**	**54.55**
Function score (gain)	**39.87**	**53.00**
Knee flexion (gain)	**25.37**	**11.35**
Mean alignment	**6.3 deg**	**4.2 deg**
Results (good/excellent)	**94.8%**	**90%**

Table.2

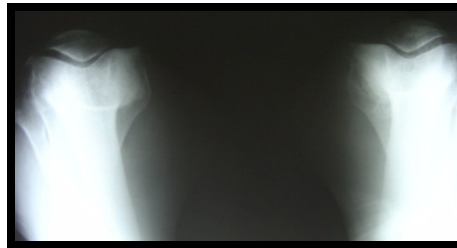| Study	Konig A, Scheidler M et al	Our study
No. of knees	**97**	**20**
Follow-up	**4.5 years**	**3.5 years**
Superficial infection	**04 (4.2%)**	**02 (10%)**
Deep infection	**02**	**nil**

Pre-op X-Rays

Ap-view
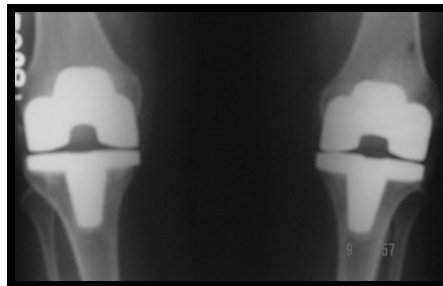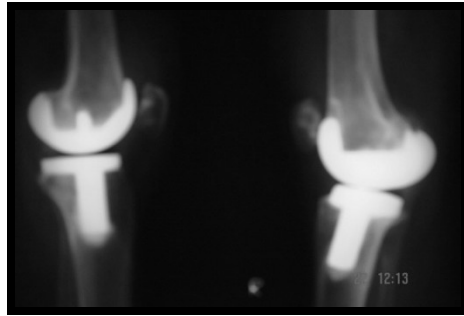

Lateral view

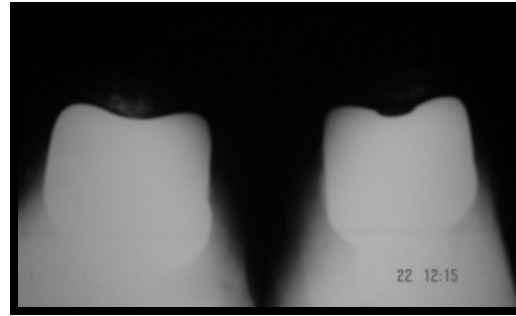Axial View

Post-op X-rays

AP-View

Lateral view

Axial view

The average follow-up in our study was 3.2 years compared to 6.5 years in the study by Bentley et al. The mean age of follow-up was 59.66 years compared to 65.2 years in the comparative study. We used both PCL retaining and substituting prosthesis, whereas PCL retaining prosthesis alone was used in Bentley et al study. The average gain in knee and function scores was 54.55 and 53.0 in our study, whereas it was 42.94 and 39.87 in the study by Bentley et al. The average gain in ROM (knee flexion) was 10.9 degrees in our study compared to 25.37 degrees in the study by Bentley et al. The mean post-operative valgus was 4.2 degrees compared to 6.3 degrees in Bentley et al study. We had an overall 90% good/excellent result compared to 94.8% results shown by Bentley et al.

In our study, we had two cases (10%) complicated by superficial infection. No patients had DVT/PTE, as we advocated active exercises of calf and ankle from the very first post-operative day and thromboprophylaxis in some patients.

In an other comparative study by Konig A, Scheidler M et al there 97 knees followed up for a period of 4.5 years. They had 4 cases (4.2%) of superficial infection and 2 cases with deep infection compared to our study which had 2 cases (10%) of superficial infection and no cases with deep infection respectively.

In conclusion, *this study is a short-term follow up with a maximum period of 3 ½ years (average – 22 months).* Total Knee Arthroplasty is a very effective surgery in severe arthritic knee. Total Knee Arthroplasty gives 90% Excellent/Good results in arthritis. Functional results are good irrespective of the severity of the deformity. Restoration to ideal valgus alignment is possible with careful surgical technique. Total knee arthroplasty in short term relieves pain, improves stability, functional ability, corrects deformity. Short term Clinical, Functional and radiological outcome following Total Knee Arthroplasty for Tricompartmental arthritis are good.

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