

To Study the Functional Outcomes of Proximal Fibular Osteotomy in Osteoarthritis Knee

Rakesh Kumar Verma¹, Ashish Agrawal²

ABSTRACT

Introduction: Knee osteoarthritis (OA), also known as degenerative joint disease, is typically the result of wear and tear and progressive loss of articular cartilage leading to radiologically decreased joint space. Proximal fibular osteotomy (PFO) is an alternative treatment to high tibial osteotomy (HTO). Hence; under the light of above mentioned data, the present study was undertaken for assessing the functional outcomes of proximal fibular osteotomy in osteoarthritis knee.

Material and methods: A total of 10 patients with OA of knee were enrolled in the present study. The patients were placed in the supine position after administration of spinal anaesthesia. An approximately 5-cm longitudinal incision was made over the lateral aspect of the proximal fibula, and the fibula exposed between the peroneus muscle and soleus muscle. PFO was performed under the hands of skilled and experienced orthopaedic surgeon. Knee pain was assessed using a Visual analogue scale. Knee ambulation activities were recorded using the knee and function subscores of the American Knee Society score (KSS). All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test and Mann Whitney U test were used for assessment of level of significance.

Results: Mean KSS score at pre-operative, postoperative, postoperative 6 weeks and postoperative 9 months were found to be 44.03, 53.50, 58.60 and 68.14 respectively. Significant results were obtained while comparing the mean KSS at different postoperative time intervals. In the present study, mean VAS score at pre-operative, postoperative, postoperative 6 weeks and postoperative 9 months were found to be 8.77, 6.96, 4.36 and 2.52 respectively. Significant results were obtained while comparing the mean VAS at different postoperative time intervals.

Conclusion: PFO is a novel alternative method in the management of medial compartment arthritis of the knee.

Keywords: Proximal, Fibular, Osteoarthritis

joint area. It is more common in older women and men. Knee osteoarthritis can be divided into two types, primary and secondary. Rheumatoid arthritis is a degenerative condition for no apparent reason. Secondary arthritis is the result of an abnormal recurrence of forces when encountered as cases of trauma or abnormal cartilage, such as rheumatoid arthritis (RA).¹⁻³

Knee pain is a negative sign of radiographic knee osteoarthritis that can be linked to the degree of radiographic involvement. Similarly, radiographic OA is an exciting guide to the possibility of pain or deformity of the knee. X-ray ray results should not be used alone when evaluating individual patients with knee pain. Proximal fibular osteotomy (PFO) is an alternative treatment for upper tibial osteotomy (HTO). It is a surgical procedure for medial compartment knee osteoarthritis (KOA). Compared to HTO, PFO has several advantages. First, the surgical procedure is simple and simple. Second, it is less invasive with very short appearances, requires abnormal tissue imbalances and no internal fixation is included. The recovery period is shorter and than HTO. In addition, problems associated with HTO can be a serious problem that has an impact on the occurrence of events and TKR can be done efficiently without worrying about the occurrence.⁴⁻⁶ Hence; under the light of above mentioned data, the present study was undertaken for assessing the functional outcomes of proximal fibular osteotomy in osteoarthritis knee.

MATERIAL AND METHODS

The present study was undertaken in the department of orthopaedics of the medical institute and it included assessment of the functional outcomes of proximal fibular osteotomy in osteoarthritis knee. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 10 patients with OA of knee were enrolled in the present study.

INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis in the world. It can be classified into 2 categories: primary osteoarthritis and secondary osteoarthritis. The etiology of OA is multidisciplinary and involves joint injury, obesity, aging and inheritance. Because the molecular mechanisms involved in the initiation and progression of OA are poorly understood, there are no current interventions to restore damaged cartilage or deteriorating disease progression. Knee osteoarthritis (OA), also known as degenerative disease, is usually the result of erosion and deformity and the progressive loss of cartilage that results in reduced

¹Consultant, Department of Orthopedics, ²Assistant Professor, Department of Anesthesiology, Maharaja Suhel Dev Medical College & Mahrishi Balark Hospitals, Bahraich, UP, 271801, India

Corresponding author: Dr. Ashish Agrawal, Assistant Professor, Department of Anesthesiology, Maharaja Suhel Dev Medical College & Mahrishi Balark Hospitals, Bahraich, UP, 271801, India

How to cite this article: Rakesh Kumar Verma, Ashish Agrawal. To study the functional outcomes of proximal fibular osteotomy in osteoarthritis knee. International Journal of Contemporary Medical Research 2020;7(3):C1-C3.

DOI: <http://dx.doi.org/10.21276/ijcmr.2020.7.3.7>



Inclusion criteria

1. Age of patient 45 years or older.
2. Knee pain with functional limitations.
3. Body mass index (BMI) more than or equal to 25 (Overweight).

Exclusion Criteria

1. Age of patient less than 45 years.
2. Patients in which both medial and lateral compartments of knee are involved.
3. Body mass index less than 25.
4. Patients with High Tibial Osteotomy or history of any intra-articular injection.

The patients were placed in the supine position after administration of spinal anaesthesia. An approximately 5-cm longitudinal incision was made over the lateral aspect of the proximal fibula, and the fibula exposed between the peroneus muscle and soleus muscle. PFO was performed under the hands of skilled and experienced orthopaedic surgeon. Knee pain was assessed using a Visual analogue scale. Knee ambulation activities were recorded using the knee and function subscores of the American Knee Society score. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test and Mann Whitney U test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

Mean age of the patients was found to be 58.9 years. 50 percent of the patients belonged to the age group of 56 to 65 years (table-1). 80 percent of the patients (8 patients) of the present study were females while the remaining 20 percent were males (table-2). Right knee involvement occurred in 60 percent of the patients with OA, while left knee involvement

Age group (years)	Number of patients	Percentage of patients
45 to 55	3	30
56 to 65	5	50
More than 65	2	20
Total	10	100

Table-1: Age-wise distribution of patients

Gender	Number of patients	Percentage of patients
Males	2	20
Females	8	80
Total	10	100

Table-2: Gender-wise distribution of patients

Time interval	Mean KSS objective score	p- value
Pre-operative	44.03	0.00 (Significant)
Postoperative	53.50	
Postoperative 6 weeks	58.60	
Postoperative 9 months	68.14	

Table-3: Mean KSS score at different time intervals

Time interval	Mean VAS	p- value
Pre-operative	8.77	0.000 (Significant)
Postoperative	6.96	
Postoperative 6 weeks	4.36	
Postoperative 9 months	2.52	

Table-4: Mean VAS score at different time intervals

occurred in 40 percent of the patients. Mean KSS score at pre-operative, postoperative, postoperative 6 weeks and postoperative 9 months were found to be 44.03, 53.50, 58.60 and 68.14 respectively (table-3). Significant results were obtained while comparing the mean KSS at different postoperative time intervals. In the present study, mean VAS score at pre-operative, postoperative, postoperative 6 weeks and postoperative 9 months were found to be 8.77, 6.96, 4.36 and 2.52 respectively. Significant results were obtained while comparing the mean VAS at different postoperative time intervals (table-4).

DISCUSSION

Patients with OA are at a higher risk of death compared with the general population. The history of diabetes, cancer, or heart disease and the presence of mobility impairments are major risk factors. Overdose deaths are seen in all diseases that have specific causes of death but are much more pronounced due to heart problems. Knee OA is important not only for the rate of its increase in comparison with other forms of OA but also for its presentation in the age groups and especially in the younger age groups of obese women. The incidence of knee OA increases with age and increases with longevity and higher mortality.⁷⁻⁹ In the current study, the mean age of the patients was found to be 58.9 years. Fifty percent of patients were in the age groups of 56 to 65 years. 80% of the patients (8 patients) of the present study were female while the remaining 20 percent were male. Right knee involvement occurs in 60% of patients with OA, while knee involvement occurs in 40 percent of patients. Misra RK et al quickly analyzed 38 patients who received PFO. Clinical data, Visual Analogue Scale score (VAS score) and American Knee Society Score (AKSS score) were recorded. Patients are followed up at 6 weeks, 12 weeks, and 6 months postoperatively. 38 patients (38 knees) were included in the study for which 6 of the knees (L = 2, R = 4) were male and 32 knees (L = 11, R = 21) were female. The average VAS performance score, KSS clinical score and performance were 7.89 ± 1.01 points (from 4 points to 9 points), 47.23 ± 11.05 points (from 26 points to 90) and 45.85 ± 16.62 points (from 0 to 90 points), respectively. At 6 months, the visual analogue response rate dropped dramatically to 2.74-2.34 postoperatively. There was a significant improvement in average KSS clinical performance and performance of 67.11 ± 10.09 points (from 31 points to 94 points) and 65.67 ± 12.22 points (from 22 points to 100 points), respectively. The ratio of the medial knee joint (medial / lateral compartment) increased from an average of 0.38 ± 0.12 preoperatively to 0.56 ± 0.13 postoperatively. PFO is a promising surgical procedure in

countries that lack financial and medical resources.¹⁰

In the present study, the Def KSS score at pre-operative, postoperative 6 weeks and postoperative 9 months was found to be 44.03, 53.50, 58.60 and 68.14 respectively. Significant results were obtained while comparing KSS mean at different postoperative times. Wang J et al (2019) revealed that the fibula is flexible and its relation to the age and resolution of the medial tibial bone, and to evaluate the process of proximal partial fibulectomy in the treatment of medial compartment knee osteoarthritis (OA). Weight - loaded - fully leg - anteroposterior (AP) of 280 adults (560 knees) was enrolled, including 157 men and 123 women, with a mean age of 50.3 ± 14.8 years (range, 19 years). 80). The severity of the knee OA was evaluated using Kellgren and Lawrence (K-L) grading. The resolution of the ilial arterial table was evaluated using the medial proximal tibial angle (MPTA). Curvature of the tibia and fibula were calculated as proximal tibial curvature (PTC), distal tibial curvature (DTC), proximal fibular curvature (PFC), and distal fibular curvature (DFC). K-L grade of knee OA significantly increased with age ($\chi^2 = 182.169$, $P < 0.01$). Multivariate regression analysis showed that MPTA and fibular curvature correlated negatively with age, and MPTA was negatively associated with PFC. The proximity curve of the fibula is increased in patients with left knee complication, and this change is positively associated with the age and settlement of the medial tibial artery.¹¹

In the present study, mean VAS scores at pre-operative, postoperative 6 weeks and postoperative 9 months were found to be 8.77, 6.96, 4.36 and 2.52 respectively. Significant results were obtained when comparing VAS mean at different postoperative times. Sukumaran S et al examined the functional and radiological effect of the medial knee of osteoarthritic degeneration treated with proximal fibular osteotomy as a new treatment. Fifteen patients who had undergone knee icalotomy for medial compartment osteoarthritis were unintentionally followed. Pre-operative and post-operative weight gram was found to analyze the alignment of the lower leg (Femoro tibial angle) and the extent of the joint area (joint space). Performance Outcome was assessed with the American Knee Society Score (KSS) and Knee pain was assessed on a visual analogue scale. The Knee Society Score score at the last follow-up was 75.13 which was higher than the performance score 52.5. Vas vascular status is significantly reduced to 4 (mean Vas score is 8 studies. Studies have shown fibular re-relieves) and improves joint function in patients with medial compartment osteoarthritis of the knee by removing the mechanical axis.¹²

CONCLUSION

PFO is a novel alternative method in the management of medial compartment arthritis of the knee. It is a simple, cost effective, easy to perform procedure and gives drastic pain relief postoperatively.

REFERENCES

1. Zou G, Lan W, Zeng Y, Xie J, Chen S, Qiu Y. Early clinical effect of proximal fibular osteotomy on knee osteoarthritis. *Biomedical Research*. 2017; 28: 9291-9294.
2. Shah RK, Paudel SR and Kalawar RPS. Role of Proximal Fibular Osteotomy in Medial Joint Osteoarthritis of Knee. *Austin J Orthopade & Rheumatol*. 2018; 5: 1071.
3. Subash Y, Naidu GK. The role of proximal fibular osteotomy in the management of medial compartment osteoarthritis of the knee. *IJOS* 2018; 4: 369-372.
4. Qin D, Chen W, Wang J, Lv H, Ma W, Dong T, Zhang Y. Mechanism and influencing factors of proximal fibular osteotomy for treatment of medial compartment knee osteoarthritis: A prospective study. *J Int Med Res*. 2018;46:3114-3123.
5. Lu ZK, Huang C, Wang F, Miao S, Zeng L, He S, Ye X, Chen W. Combination of Proximal Fibulectomy with Arthroscopic Partial Meniscectomy for Medial Compartment Osteoarthritis Accompanied by Medial Meniscal Tear. *Journal of Clinical and Diagnostic Research*. 2018;12: RC01-RC03.
6. Sachdev T, Dwivedi A, Kumar A. Comparative Analysis Between Proximal Fibular Osteotomy And PRP Injection In Medial Compartment Osteoarthritis Knee Patients. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*. 2018; 17: 74-93.
7. Rai AK, Saurabh A, Shekhar S, Kunwar A, Verma V. Proximal fibular osteotomy for pain relief and functional improvement in patients of osteoarthritis of knee. 2019; 6: 2368-2372.
8. Prakash L. PFO - Proximal Fibular Osteotomy in Medial Compartment Arthritis of the Knee with Varus Deformity. *EC. Orthopaedics*. 2019; 10: 315-321.
9. Jaheer HSH, Shetty AA, Choi NY, Kim KW, Thirumal SV, Song JS, Kim KS, Chun YS, Kim SJ. Preliminary results of high fibular osteotomy (HFO) and cartilage regeneration procedure for medial compartment osteoarthritis of knee with varus deformity. *Regen Ther*. 2019;10:112-117.
10. Misra RK, Batra AVK. Clinical and Functional Outcomes of Proximal Fibular Osteotomy on Varus Deformity and Medial Compartment Knee Osteoarthritis. *J Arthritis* 2019, 8:3.
11. Wang J, Lv HZ, Chen W, Fan MK, Li M, Zhang YZ. Anatomical Adaptation of Fibula and its Mechanism of Proximal Partial Fibulectomy Associated with Medial Compartment Knee Osteoarthritis. *Orthopaedic surgery*. 2019; 11: 204-211.
12. Sukumaran S, Ashokan C, Nagendran K, Kathirazhagan S. Is proximal fibular osteotomy a boon or bane for medial compartment osteoarthritis? - Our experience. *International Journal of Orthopaedics Sciences* 2019; 5: 1001-1004.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 17-01-2020; **Accepted:** 01-03-2020; **Published:** 12-03-2020