



STUDY OF THE FUNCTIONAL OUTCOME OF PROXIMAL FIBULAR OSTEOTOMY IN OSTEOARTHRITIS OF KNEE JOINT.

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ABSTRACT

BACKGROUND Osteoarthritis of knee joint is a degenerative, "wear-and-tear" type of arthritis that occurs most often in people 50 years of age and older. Osteoarthritis (OA) is the most common joint disorder resulting in morbidity in old age. Symptomatic knee OA occurs in 10% men and 13% in women aged 50 years or older. Various operative and conservative management options are available at present for the treatment of OA knee having their own limitations and complications.

Various studies reporting that proximal fibular osteotomy (Proximal fibular osteotomy) relieves pain and improves joint function in human knee osteoarthritis have been documented

In the present study, we carefully evaluated the short-term efficacy of Proximal fibular osteotomy in terms of pain relief and improvement of joint function in a of patients from our hospital.

AIM AND OBJECTIVE: To evaluate the effectiveness of proximal fibular osteotomy in osteoarthritis of knee joint

MATERIAL AND METHODS: This prospective study was carried out among patients with osteoarthritis of knee joint and getting admitted for treatment at orthopaedic department at tertiary care centre. Study was carried out for a period of 18 months. Patients aged between 45-75 years having osteoarthritis of knee who were clinically symptomatic and was confirmed on X ray using Kallgen Lawrence score were included in the study. Patients with infective condition in and around the knee joint, with tibial plateau fractures and/or distal femoral fracture and patients with medical contraindications was excluded from the study. Data analysis was done with the help of appropriate resources. Quantitative data was presented with the help of statistical analysis and comparison among study group was done with the help of unpaired T test. Qualitative data was represented with frequency and percentage tables, association among study parameters was assessed with the help of chi-square test. P value less than 0.05 is taken as significant level.

RESULTS: Mean age in years was 62.23 ± 6.37 , ranging from 48 to 75 years. Majority 53.33% were females. Right side affecting more commonly (56.67) than left. 60% of the patients were having BMI <24.9 and 40% above it. Majority of them (56.67) belong to Grade II of KL radiological grading, 36.67 to Grade III and 6.67% to Grade I. Mean Varus angle was 7.6 degrees. Applying multiple regression to KOOS score r2 value is 0.9 and p value was 0.05.

53.34% cases showed excellent functional outcome, 33.34% showed good and 13.33% showed fair outcome. Complications were seen among 10% cases.

CONCLUSION: Present study concludes that Proximal fibular osteotomy as a treatment modality for early osteoarthritis of knee joint gives good functional and radiological outcomes. Complications noted were also very less.

KEYWORDS : Functional Outcome, Proximal fibular osteotomy, medial compartment osteoarthritis of knee.

INTRODUCTION

Osteoarthritis was the term proposed by John Spender in 1886. Osteoarthritis of the knee is a progressive disease of the joint associated with degeneration of the articular cartilage leading to pain, deformity, disability and decrease in the range of motion of the affected joint, typically the result of wear and tear and progressive loss of articular cartilage. It is a common form of arthritis and one of the leading causes of disability in elderly population, affecting around 250 million people worldwide.^{1,2} Clinical symptoms include knee pain that is gradual in onset and worse with activity, knee stiffness and swelling.

Risk Factors for osteoarthritis of knee joint include: 1) modifiable factors like articular trauma, Occupation like prolonged standing and repetitive knee bending, muscle weakness or imbalance, weight, health-metabolic syndrome 2) non-modifiable factors like gender - females more prone than males, age and genetics. Depending on the source, roughly 13% of women and 10% of men 60 years and older have symptomatic knee osteoarthritis.³

Treatment for degenerative osteoarthritis of the knee joint

includes both conservative or non surgical and operative management. Non-operative modalities include patient awareness, lifestyle modification, physical therapy, weight loss, knee bracing, analgesics medications, intra articular visco-supplementation agent like glucosamine and chondroitin sulfate, corticosteroid injections, etc. Operative modalities include arthroscopic lavage, high tibial osteotomy, unicompartmental knee arthroplasty (UKA) for comparatively younger population having varus deformity or medial compartment osteoarthritis and total knee arthroplasty (TKA) for tricompartment osteoarthritis of knee joint in elderly.

Since its introduction in 1950s, the results of unicompartmental knee arthroplasty remain controversial and can be used in cases with up to moderate arthritis and when diseased is confined to one compartment.⁴

Hence, there is a necessity for a technique that is modest to do, easily reproducible, provides decent functional outcomes and associated with a smaller recovery period and develops the quality of life for the affected patients. In this set-up, PFO is a relatively new and novel procedure which according to previously published and ongoing studies has been proven to

be very effective in the management of medial compartment arthritis of the knee.

MATERIAL AND METHODS:

This prospective study was carried out among patients with osteoarthritis of knee joint getting admitted under orthopaedic department at tertiary care center. Study was carried out for a period of 18 months. Patients aged between 45-75 years with clinically significant knee pain and suggestive X ray findings of medial compartment OA of knee were included in the study. Patients with infective condition in and around the knee joint, traumatic injuries of knee joint, tri compartment OA and patients with medical contraindications was excluded from the study. All the patients were informed about study and written informed consents were obtained from them. The study protocol was evaluated and approval was obtained from the Institutional Ethics Committee. All patients were worked up for OT with thorough clinical examination, standard AP and lat radiograph of knee joint, KOOS score, Pre anesthetic check up and then operated under spinal anaesthesia. Patient placed in supine with knee flexed 45 degrees and the level of osteotomy is pre-determined and measurements marked. Skin incision of length made 6-7 cm with fibular head as a landmark and using the previously marked points. Muscles desected and fibula shaft reached, The osteotomy level is marked using drill holes and further osteotomy can be done 6-8 from fibula head. The osteotomised fragment being removed and ends smoothed. The wound closed using nylon interrupted sutures and compressive dressing applied . Weight bearing and physiotherapy was started from day 1. Dressing was checked on the 2nd and 5th post operative day. Suture removal was done after 12th post operative day. Patients were followed on 1st, 2nd, 3rd, and 6th months and there after yearly. Data analysis was done with the help of appropriate resource.

RESULTS -

Mean age in years was 62.23±7.83, ranging from 48 to 75 years. Majority 53.33% were females. Right side affecting more commonly (56.67) than left. 60% of the patients were having BMI <24.9 and 40% above it. Majority of them (56.67) belong to Grade II of KL radiological grading, 36.67 to Grade III and 6.67% to Grade I. Mean Varus angle was 7.6 degrees. Applying multiple regression to KOOS score r2 value is 0.9 and p value was 0.05.

53.34% cases showed excellent functional outcome, 33.34% showed good and 13.33% showed fair outcome. Complications were seen among 10% cases.

Table 2: KOOS score

KOOS score	Mean	SD	P value
Preoperative	66.46	5.82	<0.0001*
Day 2	71.03	6.20	
1 month	73.83	6.26	
3 month	76.10	6.90	
6 month	77.5	7.06	

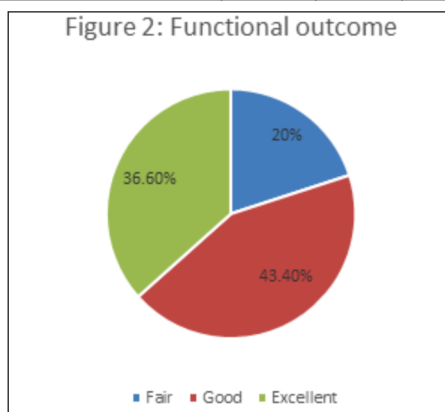


Table 3: Complications

COMPLICATIONS	FREQ	%
NO	27	90
SUP INFECTION	2	6.67
NEUROPRAXIA	1	3.34
VASCULAR INJURY	0	0

DISCUSSION:

The probability of development of OA substantially increases every 10 years after the age of 45 years.⁵ The development and progression of knee OA comprises genetic ,mechanical, environmental ,structural, and social factors. While at the time of growth and development, the tibial and femoral cartilage undergo adaptation then gradually to cyclic loading when the person starts walking;⁶

Interruption of usual gait mechanics with trivial slips,falls, ligament lax states, obesity and high or low velocity injuries and ill fitting shoes may shift the loading mechanisms to the alternate, while weightbearing on the pressurised chondrogenic areas those are not well suited to acclimatise loads.⁶ , Even though normal hale cartilage tortorts positively to loading and rises regional thickness, unhealthy or minimally injured cartilage degenerates and shrinkages the regional bluffed thickness.⁶

Biomechanical analysis has shown that in single-leg stance the ground reaction vector (GRV) is positioned medial to the knee joint center and results in 64%–77% of the load passes through the medial compartment of the knee and 23%–36% through the lateral compartment⁷ , which is suggested as a predisposing factor for osteoarthritis.⁸

High tibial osteotomy is usually recognized method for the treatment of knee varus deformities subsequent from medial femorotibial. OA in young and energetic patients. Post high tibial osteotomy in many researches, most of the patients resumed to work with the same strength, and vast number of them had resumption to their playing activities.^{9,10} However, since this is a technically demanding operation, complications are common and comprise nonunion, neuronal injury vessel injury, instrument irritation, and infection .

Rationale behind PFO :- There are theories like concepts of

- i) non uniform settlement s/o The bone density of the fibula was found to be higher than the medial tibial plateau. With osteoporosis, the support of the fibula by the lateral tibial plateau does not allow the lateral side to "settle" creating a varus deformity.
- ii) The too-many-cortices theory – Another theory is that the medial condyle is supported by one cortex whereas the lateral condyle is supported by one tibial cortex and two fibular cortices making it difficult to balance loading
- iii) The concept of competition of muscles – It was found that there was a competition of muscles between biceps femoris and peroneus after high-fibular osteotomy. It was found that muscle activity increased in the long head of biceps femoris and decreased in the peroneus longus on the side operated on immediately after high-fibular osteotomy. This explained the immediate improvement from a more varus to a more neutral alignment immediately after high-fibular osteotomy.

Other theories include Slippage phenomenon

- 2. Dynamic fibular distalisation theory
- 3. Ground reaction vector readjustment theory

CONCLUSION

Present study concludes that Proximal fibular osteotomy as a treatment modality for early osteoarthritis of knee joint gives good functional and radiological outcomes. Complications noted were also very less.

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