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EVALUATION OF JOINT CONVERGENCE ANGLE AFTER PROXIMAL FIBULAR OSTEOTOMY IN OSTEOARTHRITIS OF KNEE

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ABSTRACT

The aim of this was to study the effect of PFO on the predominant medial compartment osteoarthritis knee. In a period of one year, 40 patients with predominant medial compartment osteoarthritis were operated in our department of orthopaedics. 2cm long fibula was resected 7 cm to 9 cm distally from the head of fibula. In our study, the average age of presentation was 64.1 year. The outcome was evaluated radiologically by using JCA. Follow up was done according to set proforma. At final follow up JCA improved to 3.13± 1.223 degree from 1.3± 0.853 degree preoperatively(both values were significant P<0.001). It was concluded that PFO is a new and cost effective surgery for predominant medial compartment osteoarthritis of knee with obvious opening of the joint space and correction in varus angulation of the knee.

KEYWORDS: PFO - Proximal Fibular Osteotomy JCA – Joint Convergence Angle.

INTRODUCTION

Knee Osteoarthritis is a common joint disease with an incidence of 30% of the world population older than 60 years.[1] Early clinical symptoms of Knee osteoarthritis include pain, stiffness and limitation of range of movement. Eventually with the progression of the disease there is knee varus deformities and joint failure leading to chronic pain and disability. OA of the knee is a major cause of mobility impairment, particularly among females.[2] The initiation and progression of knee OA involves mechanical, structural, genetic and environmental factors.[3]

Overall osteoarthritis can be classified as Primary and Secondary. Primary OA is the one where there is no known cause and is mostly associated with aging. Secondary OA is where there is underlying disease or condition which is leading to its development and progression. Causes of secondary OA may include joint injury, infection, pre-existing deformity, obesity, hyperthyroidism, osteoporosis etc.

Conventional treatment for OA includes lifestyle modification, weight reduction, physiotherapy, analgesia, steroid injections, anti-inflammatory medications etc.[4] Apart from the lifestyle and pharmacological approaches there are various surgical alternatives also available for the treatment.

The surgical options include arthroscopic debridement, cartilage repair surgery, osteotomy with axis correction, and uni-compartmental or total knee arthroplasty(TKA) High Tibial Osteotomy (HTO) has been accepted to be of value in relieving pain, restoring stability and improving function[5] in patients with medial compartment OA of the knee with varus deformity. HTO can be a technically demanding procedure and may result in complications including neurovascular injury, iatrogenic fracture, and non-union.[6] Also, postoperatively there is a trend of the results to get worse with time and a part of the patients had been revised to total knee arthroplasty because of poor result.

Total knee arthroplasty can correct lower extremity alignment, relieve pain, and improve function significantly. However, for younger, active patients or patients with moderate OA, it may not be the treatment of choice.[7] In 2015 Zhang et al. reported that Proximal Fibular Osteotomy (PFO) relieves pain and improves joint function in knee osteoarthritis.[13] This new surgery is simple, safe and affordable.[8]

AIMS AND OBJECTIVE

To study the changes in joint space using joint convergence angle after Proximal osteotomy.

METHODOLOGY

The aim was to study the changes in joint convergence angle after proximal fibular osteotomy in osteoarthritis of knee which was carried out in the Department of Orthopaedics, Traumatology and Rehabilitation N.S.C.B. Medical College Jabalpur (M.P.) The age of 60-69 years

including both male and female gender were taken for study. Ethical clearance was obtained before beginning of the study from ethical clearance committee.

Total 40 knees with medial compartment osteoarthritis were operated during this period. These all patients were included in our study and were followed up prospectively and joint convergence angle was evaluated. These patients were assessed as per set proforma.

INCLUSION CRITERIA

1. Patients with moderate symptomatic degenerative osteoarthritis of the knee.
2. Patients with severe symptomatic degenerative osteoarthritis of the knee.
3. Patients on whom conservative management has failed.
4. Patients who have given informed consent.

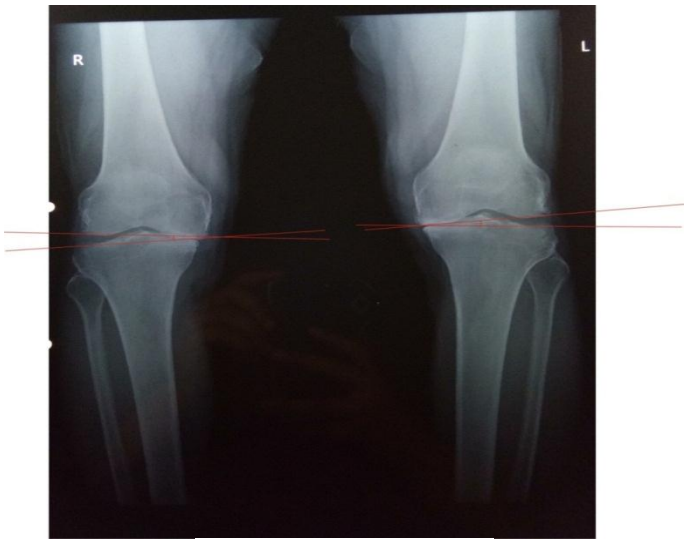
EXCLUSION CRITERIA

1. Patients who have inflammatory or post traumatic osteoarthritis of knee.
2. Patients who have any history of previous operations or fractures around the knee.
3. Patients who have not given informed consent.

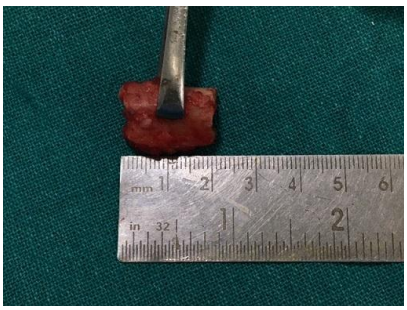
SURGICAL TECHNIQUE

We used the Henry's posterolateral approach for exposure of proximal fibula.

- The head of fibula was palpated and surface marking of the head with length of incision and osteotomy site was done.
- Approximately a 5 cm long incision was made over the posterolateral border of the fibula centred over the point 7 cm below the head of fibula.
- Fascia between peroneus longus and soleus muscle was identified and cut.
- Fibula was exposed from the posterolateral aspect.
- Again the level of osteotomy was confirmed and 2 cm of segment of fibula was marked.
- A 2 cm section of fibula was excised 7cm below the fibular head.
- The osteotomy can be done by either multiple drill holes and osteotome or Gigli saw or oscillating saw (in this only lateral cortex is cut with oscillating saw; the medial cortex is cut by osteotome).
- The muscles fascia, skin were closed separately in layers after ample irrigation with normal saline.



Joint Convergence Angle

		
Surface marking of head of fibula with length of incision and osteotomy site	Fibula exposed through posterolateral aspect	2 cm section of fibula

Pre-Operative			Post-Operative		
Radiograph R L			Radiograph		
					
R	Rt. JCA - 4^0	Lt. JCA - 4^0 L		Rt. JCA - 1^0	Lt. JCA - 2^0

The patients were ambulated as early as possible after the anaesthesia wore off. Also static quadriceps exercise was started and the patients were made to walk as per comfort level. The patients were discharged on day 3 post op.

RESULT

Authors compared the pre-operative joint convergence angle with the postoperative joint convergence angle. There was significant improvement in joint convergence angle from 3.13+1.223 degrees to 1.3+0.853degrees. (chi square test was applied and $P < 0.0001$ which is < 0.05 so, it is statistically significant)

CONCLUSION

In our study we concluded that proximal fibular osteotomy is a novel surgery for Indian population with medial compartment osteoarthritis of knee with better functional outcome of patients and significant improvement in joint convergence angle. This surgery is less technically demanding, cost effective and can be performed at a small setup with minimum armamentarium.

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