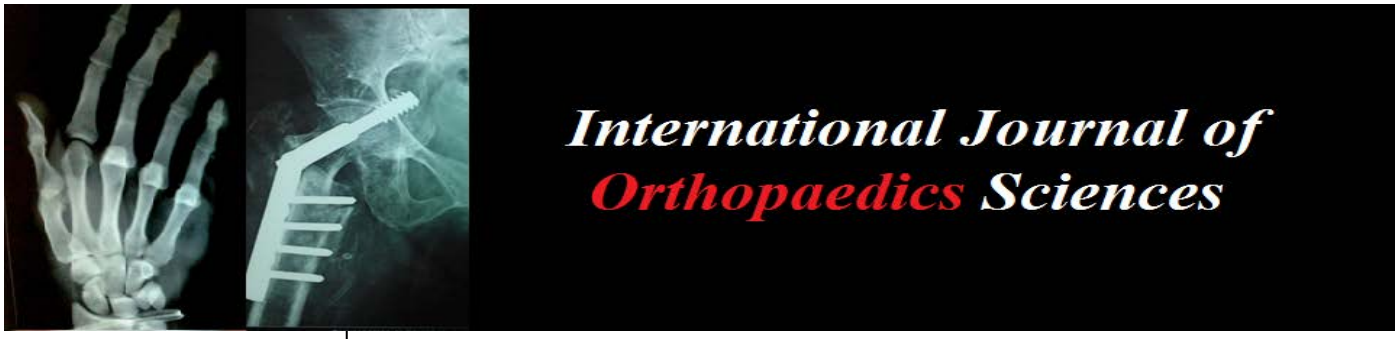

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Clinical and functional outcome of proximal fibular osteotomy for management of medial compartment osteoarthritis of the knee

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Abstract
Osteoarthritis (OA) of the knee joint is a chronic, degenerative disease associated with pain, decreased range of motion, and deformity in the affected joint. Proximal fibular osteotomy (PFO) works on the principal that by removing proximal part of Fibula, medial and lateral compartment of the knee are evenly loaded on weight bearing and hence the medial joint pain and Arthritic changes resolve. This study was undertaken to study outcomes of Proximal fibular osteotomy (PFO) in the Population of South Gujarat attending our hospitals with medial compartment Osteoarthritis of The knee.
Materials and Methodology: This is a prospective study of patients who attended the orthopedic out pateint Department in our hospital between September 2018 to November 2019. .In our orthopedics department 42 patient operated for medial compartment Osteoarthritis of the knee with proximal fibular osteotomy. In the follow up Period 5 patient lost follow up in the covid 19 pandemic and 2 patient expired Due to covid 19. So that this patient excluded from the study.
Results: In our study, in terms of improvement, two significant differences were found in terms of pain relief, the mean VAS before surgery was 8.00 ± 0.79, which Improved to 2.25 ± 0.792; that was significant in terms of patient relief of pain. Similarly, in terms of comparison of function, the mean preoperative knee Clinical score was 42.75 postoperatively it improved to 83.25 and mean knee Functional score preoperative was 72.5 and postoperatively was 94.37. All These findings, i.e., VAS, and knee score and functional score, were all Suggestive of the beneficial effects of PFO in terms of pain relief and function. Mean HKA angel pre-operative was 173 and postoperatively 173.87 Suggested minimal alignment of mechanical axis.
Conclusions: Proximal fibular osteotomy is a simple, safe, less time consuming, and Effective procedure for pain relief and functional recovery. It requires little Rehabilitation and is associated with little or no complications. After a review of the results of our study it was revealed that this procedure is reasonably good both clinically and radiologically, and can be recommended for Medial compartment OA of the knee joint

Keywords: Osteoarthritis, degenerative disease, fibular osteotomy

1. Introduction
In most arthritic knees, some degree of instability, deformity, contracture or combination of these elements, can be found [1, 3]. The common causes of arthritis of the knee include osteoarthritis (OA), rheumatoid arthritis (RA), juvenile rheumatoid arthritis, post traumatic arthritis or secondary osteoarthritis and other types of inflammatory arthritis.
Osteoarthritis (OA) is a chronic degenerative joint disease and a major cause of disability in the elderly people [4]. The rapid increase in the prevalence of this disease suggests that OA will have a growing impact on health care and public health systems in the near future. The concept of improving knee joint function by modifying the articular surfaces has received attention since the 19th century. The surgical techniques has varied from soft tissue interposition arthroplasty to resection arthroplasty to surface replacement arthroplasty. In surface replacement arthroplasty different types of prosthesis were developed to address the complex knee kinematics.
Total knee arthroplasty (TKA) is now a reliable treatment for severe arthritis. Various systems

Osteoarthritis (OA) of the knee joint is a chronic, degenerative disease associated with pain, decreased range of motion, and deformity in the affected joint [1]. Age over 65 years of female sex, with obesity, hypertension and low frequency of strength exercises were risk factors [2].

The reported prevalence of radiographic and symptomatic OA of the knee in elderly persons above 60 years age is estimated to be 37% and 12%, respectively [3]. The prevalence in a rural Japanese population of Symptomatic knees with radiographic OA (grade 2 and above) was 35.6% and 26.5% among women and men, respectively [4]. Varus deformity is known to be common in primary OA of the knee with a reported incidence as high as 63% reported by Barrett *et al*. [5].

Proximal fibular osteotomy (PFO) is relatively newer procedure gaining popularity in the recent years because of its being less invasive and less complicated as compared to HTO or Knee arthroplasty, which have significant complications and are technically more demanding.

Proximal fibular osteotomy (PFO) works on the principal that by removing proximal part of fibula, medial and lateral compartment of the knee are evenly loaded on weight bearing and hence the medial joint pain and Arthritic changes resolve.

This study was undertaken to study outcomes of Proximal fibular osteotomy (PFO) in the population of South Gujarat attending our hospitals with medial compartment Osteoarthritis of the knee.

Materials and Methodology

This is prospective study of patients who attended the orthopedic out pateint department in our hospital between September 2018 to November 2019. The patients were evaluated by clinical examination and weight bearing radiographs. The patients who were found to have medial compartment osteoarthritis with knee pain and who satisfy the inclusion criteria were selected.

Inclusion criteria:

AGE more than 45 year, Isolated medail compartment osteoarthritis of the knee, At least 2 mm medial space present on weight bearing radiograph, Grade 2 or 3 OA Knee according to Kellgren and Lawrence Classification. Patient who give informed consent and willing for follow up.

Exclusion criteria

Traumatic Arthritis, Rheumatic Arthritis, Grade 0,1,4 OA Knee, Patient who did not give informed consent for surgery, Patient unfit for surgery.

Detailed history obtained and evaluation including base line clinical examination (general, systemic and local examination) and investigation (routine and radiological).

Plain radiograph of knee AP and lateral view in standing position, Scanogram.

Fig 1: 2 cm of size segment og fibula cut with help of either osteotom or oscillator saw gun.

Fig 2: 2 cm of size removed bone of proximal

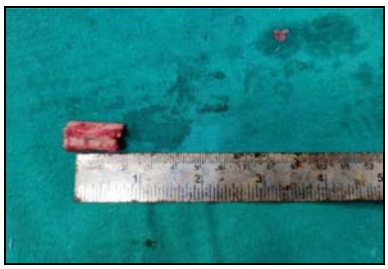

Fig 3: Surface marking for level of osteotomy.

Fig 4: 2cm of size removed bone of proximal

Fig 5: Afeter completion of procedure.

Fig 6: Post op radiograph AP STANDING view

Fig 7: Pre Op radiograph AP STANDING VIEW

Proximal fibular osteotomy was performed in 42 patients with minimum age of 45 and maximum age of 66 and the average age is 54.5 years. All the patients were followed up 1 month and 6 month. Patients were analysed for any complications and their functional outcome was compared with their previous status.

The patients were evaluated objectively by weight bearing radiographs and subjectively by visual analogue pain scale and knee society knee score.

Results

Pain was analyzed using Visual analogue scale both pre and post operatively. On the visual analogue scale for pain, majority of the patients had a score of 8 .The mean pain score of all the patients were 8.

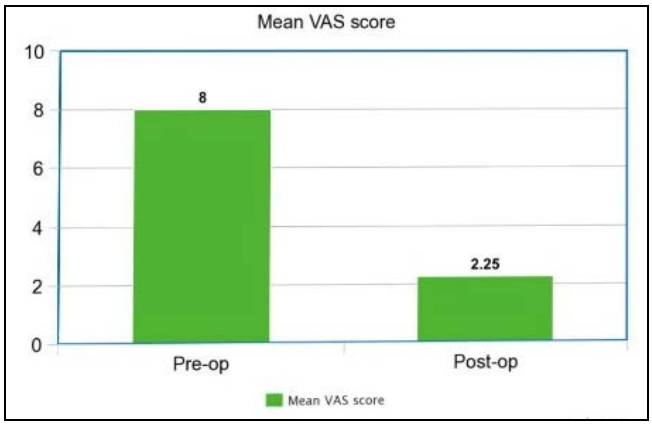

Fig 8: Post operatively Mean vas score of all patients were 2.25.

Radiographic measurements were made on each of the operated Knee. The median hip knee angle or the mechanical axis were calculated in each Patient both pre and post operatively.

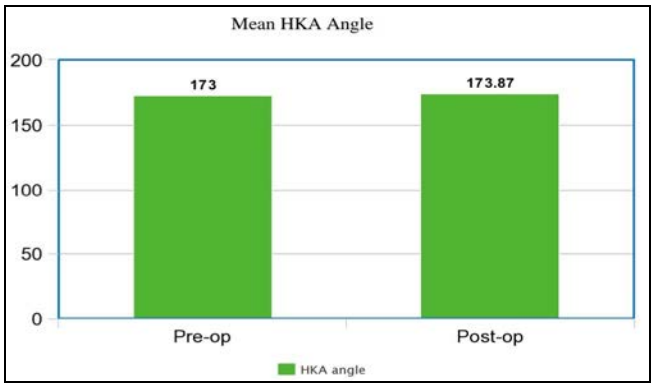

Fig 9: The mean mechanical axis in the pre-Operative and the post-operative group were 173 and 173.87 respectively.

The Functional results were evaluated according to the Knee Society Score. The Knee Society Score is divided into a knee score and a function score. The knee score evaluates pain, range of motion and stability. Maximum Number of points is 100.

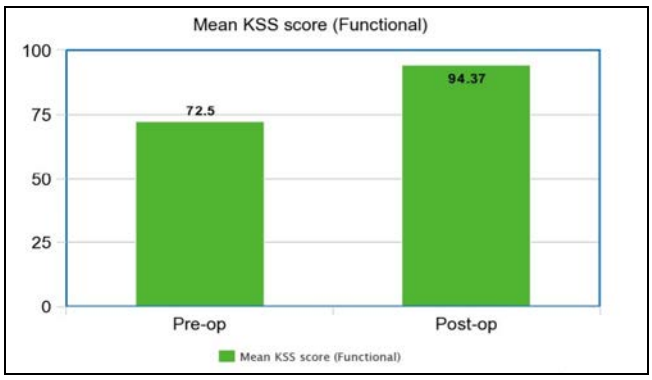

Fig 10: An average of 94.37 points was attained after proximal fibular Osteotomy compared to an average 72.5 points preoperatively.

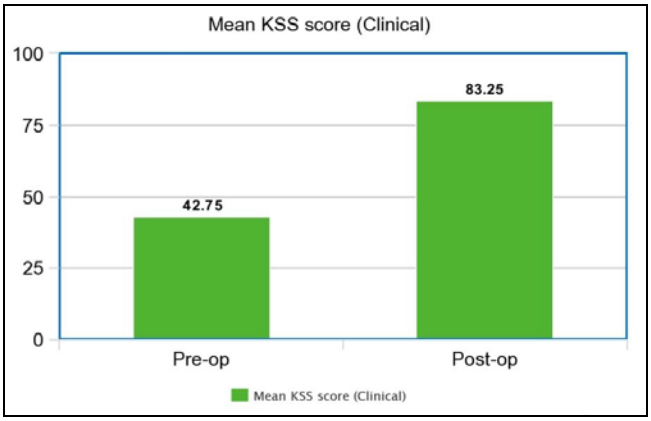

Fig 12: An average of 83.25 points (range 64-100) was achieved after proximal fibular osteotomy compared to 42.75 points preoperatively

The functional score evaluates walking distance and stair stepping and usage of any external support as aid for mobilization has a maximum score of 100 points.
All patients satisfied with operative management as patient symptomatic Relieved.

Discussion

Proximal fibular osteotomy is the new treatment option for medial compartment knee joint OA. Although high tibial osteotomy and unicompartment arthroplasty were previously the treatment options for medial compartment arthritis, both have their advantages and disadvantages and are associated with major complications [6], which include infection, deep vein thrombosis (DVT), insufficient correction, intra-articular fractures, peroneal nerve injury, compartment syndrome, and knee stiffness. In contrast, late complications of this procedure include delayed union or nonunion, deformity recurrence, and internal fixation failure [7]. There is still insufficient and inconclusive evidence in the literature on PFO in medial compartment OA of the knee. A correctly performed fibular osteotomy (in terms of accurate height from the fibular head, the length of the fibular chunk removed, and peroneal nerve protection) is paramount for a good outcome.
In a study conducted by Wang *et al*. On PFO for medial compartment, OA pain relief was observed in all patients after PFO; the mean VAS scores improved dramatically from 8.02 ± 1.50 preoperatively to 2.74 ± 2.34 postoperatively.
In another study, 15 patients who were treated by PFO and were followed up to a period of 18 months. Following the surgery all patients had drastic pain relief with the VAS score dropping significantly from 8 to 4 postoperatively. The average preoperative knee score also showed a significant improvement from 52.2 preoperatively to 79 in the postoperative period (P<0.005). Patients with nearly normal HKA angles showed better outcomes in joint function, because of the fact that PFO could only correct the varus deformity partially [8].
Rakesh Verma *et al*, total of 10 patients with OA of knee were enrolled in their study, Mean KSS score at pre-operative and postoperative were found to be 44.03 and 68.14 respectively, mean VAS score at pre-operative and postoperative were found to be 8.77 and 2.52 respectively.
In our study, in terms of improvement, two significant differences were found. In terms of pain relief, the mean VAS before surgery was 8.00 ± 0.79, which improved to 2.25 ± 0.792; that was significant in terms of patient relief of pain. Similarly, in terms of comparison of function, the mean preoperative knee clinical score was 42.75 postoperatively it improved to 83.25 and mean knee functional score preoperative was 72.5 and postoperatively was 94.37. All these findings, i.e., VAS, and knee score and functional score, were all suggestive of the beneficial effects of PFO in terms of pain relief and function. Mean HKA angel pre-operative was 173 and postoperatively 173.87 suggested minimal alignment of mechanical axis.
The results in our study were comparable to the studies conducted by other authors such as Yang *et al*. [1], Wang *et al*. [8], and Subhash and Naidu [9].
Our study demonstrates that proximal fibular osteotomy effectively relieves the pain and improves the joint function in the patients with medial compartment osteoarthritis of knee.
It is simple and safe day care surgery with less complications with immediate return to function. May negate the need for replacement. If the procedure does not give good results in any situation then the field for performing a Total knee arthroplasty at a later stage is not altered at all. Limitation of this study is smaller sample size and shorter follow up period.

Conclusions

Proximal fibular osteotomy is a simple, safe, less time consuming, and effective procedure for pain relief and functional recovery. It requires little rehabilitation and is associated with little or no complications. After a review of the results of our study it was revealed that this procedure is reasonably good both clinically and radiologically, and can be recommended for medial compartment OA of the knee joint.

References

1. ZY, Chen W, Li CX, *et al*. Medial compartment decompression by fibular osteotomy to treat medial compartment knee osteoarthritis: a pilot study. Orthopedics 2015;38:1110-1114. 10.3928/01477447-20151120-08.
2. Shanmugasundaram, *et al*. Knee Surgery & Related Research https://doi.org/10.1186/s43019-019-0016-0
3. Dillon CF, Rasch EK, Gu Q, Hirsch R. Prevalence of knee osteoarthritis in the United States: arthritis data from the Third National Health and Nutrition Examination Survey 1991-94. J Rheumatol 2006;33(11):2271-2279.
4. Shiozaki H, Koga Y, Omori G, Yamamoto G, Takahashi HE. Epidemiology of osteoarthritis of the knee in a rural Japanese population. Knee 1999;6(3):183-188.
5. Barrett JP, Rashkoff E, Sirna EC, Wilson A. Correlation of roentgenographic patterns and clinical manifestations of symptomatic idiopathic osteoarthritis of the knee. Clin Orthop Relat Res 1990;253:179-183.
6. Guo J, Zhang L, Qin D, Chen W, Dong W, Hou Z, *et al*. Changes in ankle joint alignment after proximal fibular osteotomy. PLoS One 2019;14(3):e0214002
7. Hofmann S, Lobenhoffer P, Staubli A, Van Heerwaarden R. Osteotomien am kniegelenk bei monokompartmentarthrose [Osteotomies of the knee joint in patients with monocompartmental arthritis]. Orthopade 2009;38:755-770. 10.1007/s00132-009-1458-y
8. Wang X, Wei L, Lv Z, *et al*. Proximal fibular osteotomy: a new surgery for pain relief and improvement of joint function in patients with knee osteoarthritis. J Int Med Res 2017;45:282-289. 10.1177/0300060516676630
9. Subash DY, Naidu DGK. The role of proximal fibular osteotomy in the management of medial compartment osteoarthritis of the knee. Int J Orthop Sci 2018;4:369-372. 10.22271/ortho.2018.v4.i3g.63