



E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2023; 9(1): 328-331
© 2023 IJOS
<https://www.orthopaper.com>
Received: 21-10-2022
Accepted: 28-12-2022

Dr. Janak Rathod
Professor and HOD, Department
of Orthopaedic, SMIMER
Medical College, Surat, Gujarat,
India

Dr. Sachin Patel
Junior Resident, Department of
Orthopaedic, SMIMER Medical
College, Surat, Gujarat, India

Dr. Ankur Mali
Senior Resident, Department of
Orthopaedic, SMIMER Medical
College, Surat, Gujarat, India

Dr. Hardik Vaghela
Junior Resident, Department of
Orthopaedic, SMIMER Medical
College, Surat, Gujarat, India

Corresponding Author:
Dr. Janak Rathod
Professor and HOD, Department
of Orthopaedic, SMIMER
Medical College, Surat, Gujarat,
India

To study the functional outcome of lateral wedge closing osteotomy using stapler for osteoarthritis of knee

Dr. Janak Rathod, Dr. Sachin Patel, Dr. Ankur Mali, and Dr. Hardik Vaghela

DOI: <https://doi.org/10.22271/ortho.2023.v9.i1e.3315>

Abstract

Background: To assess functional result in knee osteoarthritis treated with a Lateral Closed Wedge High Tibial Osteotomy.

Method: Thirty patients with various stages of knee osteoarthritis were treated with lateral wedge high tibial osteotomy under spinal anaesthesia. HKA axis collected post-operatively and at 06 to 09 month follow up to evaluate axis rectification and varus deformity. The Knee Society Score was used to assess the functional result.

Results: According to the Oxford knee score, 80% (n=24) of our patients had outstanding outcomes, 14% (n=4) had good outcomes, and 6% (n=2) had fair outcomes.

Conclusion: Lateral close wedge osteotomy is a low-cost treatment that enables anatomical axis alignment without requiring a total knee replacement and also avoids further advancement of knee osteoarthritis.

Keywords: Osteoarthritis of knee, lateral wedge closing wedge osteotomy, high tibial osteotomy, knee society score, oxford knee score

Introduction

Osteoarthritis is a complex illness a little degree of varus or valgus deformity of the knee affects the stress on the tibial and femoral condyles ^[1]. Knee osteoarthritis is a persistent, severe illness that causes significant impairment. According to worldwide data, osteoarthritis accounts for 3% of total global 'years lived with disability' and is connected with major health and welfare expenses. The primary symptoms of osteoarthritis are incapacitating pain, mobility limitation, and deformity. Analgesics, rest, and exercise are the first lines of symptomatic therapy. Various surgical techniques, such as synovectomy, joint debridement, arthrodesis, patellectomy, patelloplasty, and meniscectomy, have been documented in the literature on occasion. Tibial osteotomies were first utilised in the 1950s and have been widely used and improved since then. These osteotomies alter the weight-bearing axis of the knee ^[2]. Medial compartment Excessive weight bearing on the medial femoral condyle and medial tibial plateau causes a catalytic cascade of events that culminates in degradations of the joint cartilage, extrusion of articular cartilage with subsequent enchondral ossification leading to the formation of osteophytes, and those events eventually culminate in medialization of the weight bearing axis of the lower limb. In individuals with medial compartment osteoarthritis, realigning the mechanical axis in correcting varus in a close wedge high tibial osteotomy to unload the medial compartment provides considerable pain relief and extends the life of the knees. In 1964, Friedrich Pauwels ^[3] and ^[4] Paul Maquet described bone deformity repair concepts. In 1965, Mark Coventry ^[5] published his closed wedge osteotomy method, which became the gold standard for many years. In 1969, Coventry created the stepped staple to increase the congruence and depth of engagement of the staple's distal limb. The effectiveness of an osteotomy around the knee is dependent on lower extremity biomechanics, Wolff's law ^[6] of continual change of bone under stress, and load distribution in the knee.

Methods

The study will be undertaken on patients who have had lateral wedge closure osteotomy for osteoarthritis of the knee in skeletally matured patients in the Department of Orthopaedics at a tertiary care hospital in Surat between June 2021 and October 2022. Check in at 6, 8, 12, and 24 weeks. Patients with osteoarthritis with knee discomfort that was not resolved by conservative therapy and who met the inclusion criteria were chosen for HTO. The Visual Analogue Pain Scale, the Knee Society Scoring System, and the Oxford Knee Score were used to evaluate the patient prior to surgery. Pain,

Functions - Activity limits, assistance required, Maximum walking distance, blocks, Walking surfaces, Gait irregularity, Alignment will be the primary areas of evaluation for patients. Criteria for admission include Patients with Ahlbäck grades 1 and 2, aged 40 to 60 years, any gender and any side of knee involvement, exclusion criteria include valgus knee and flexion deformity, and more than 20° correction necessary. Arthritis of the knee is characterised by Ahlbäck [7] based on joint space narrowing and osteophytes, and all bilateral knee AP standing and lateral views, as well as the Rosenberg view and HKA, are performed.



Fig 1: Pre op X ray and HKA

Based on HKA axis and pre-op angle evaluation, the patients were admitted to the hospital and operated as soon as feasible. Under spinal or general anaesthetic, patients were positioned in a supine posture with the operated limb in a tourniquet, k wire placement was done according to the pre-op angle

correction evaluation, and osteotomy was conducted under C - Arm supervision. Finally, final staple fixation was performed using the C-Arm, and mechanical axis correction was done and confirmed by rod placement from ASIS to the medial malleolus tip.

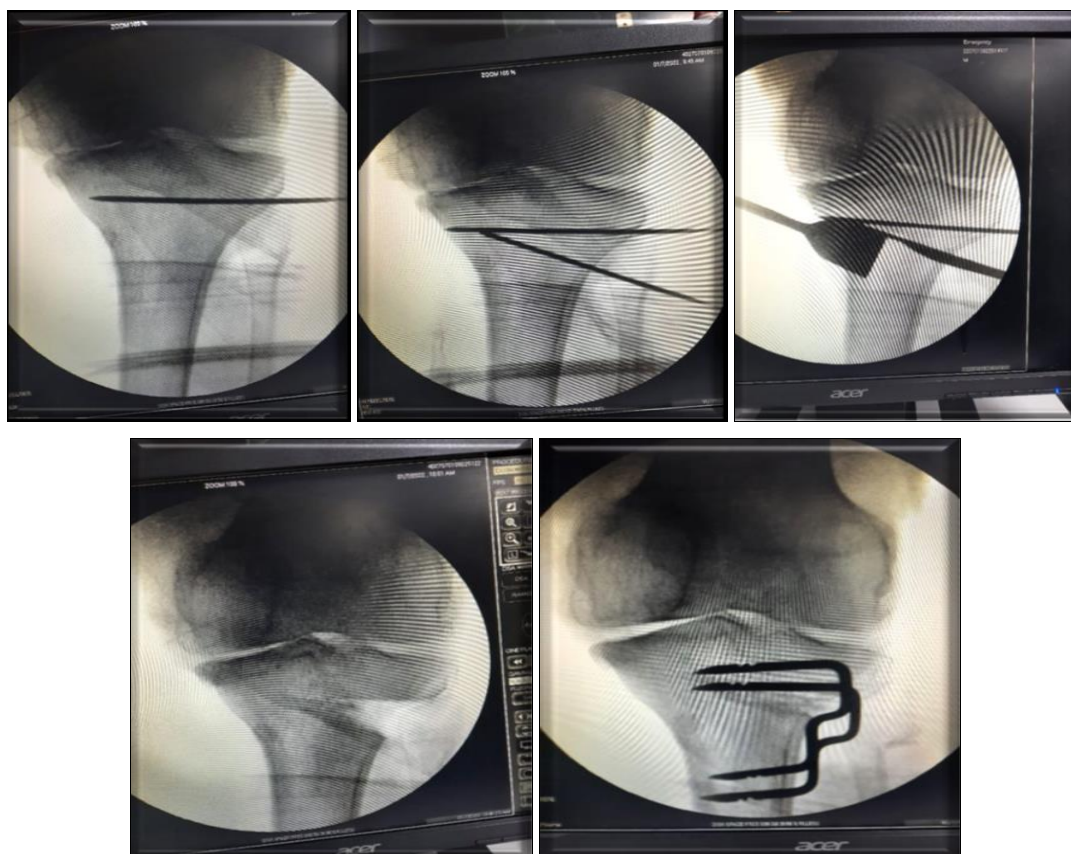


Fig 2: Intra op IITV shoot

2nd post operative day patient was advised to do active physiotherapy and dressing was done. If dressing was good then patient was discharged.

The patients' end results with exceptional and good functional outcomes were deemed adequate. Following hospital discharge, the patients were seen at our outpatient clinic at 2-

week intervals. At each follow-up, the healing of the stitch line was clinically assessed, and a HKA axis was performed for angle correction. At the end of four to eight months, a check X-ray was taken, and if satisfactory signs of union and angle correction were present, the staple was removed, and the patient was advised to gradually begin weight bearing.

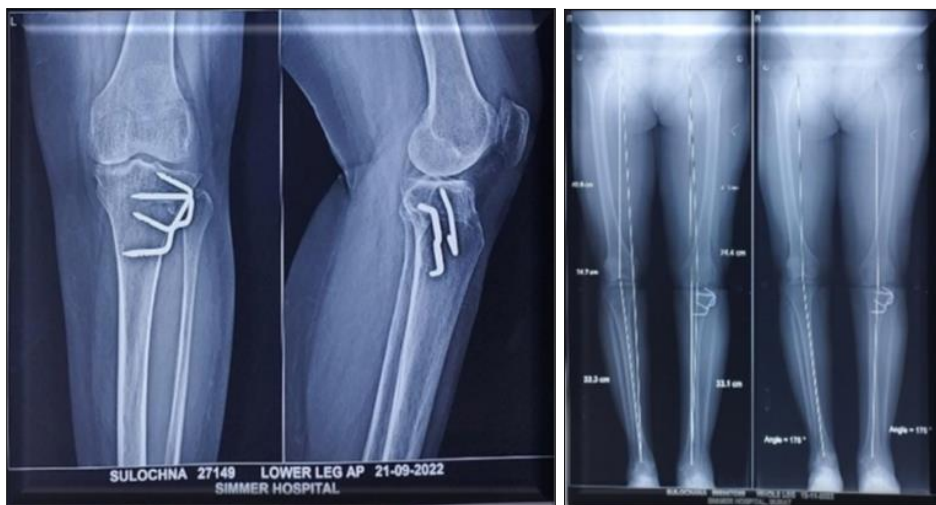


Fig 3: Post op X ray and HKA

Functional Outcome

The Knee Society Score was used to assess patients. It is a 100-point physician-rating assessment system separated into functional and clinical knee scores. The pain is graded based on the patient's account. There was discomfort, stability, deductions, and range of motion in the clinical. There was also walking, stairs, and deductions in functional score. outcomes of lateral closing wedge high tibial osteotomies for varus gonarthrosis have been associated with precise angle of correction, decreased body weight, increased activity level in the younger patient population and lower level of arthritis.

knees with a postoperative femorotibial angle of 174-180 degrees, lateral joint line obliquity of less than 4 degrees and a medial plateau force distribution of 40-60% had a decreased risk of failure.

The knees that met these criteria had a 100% survival at five and ten years. This highlights the importance of precise angle of correction and preoperative planning. No study has been able to determine a relationship between outcome and patients' age. Most surgeons agree that in cases of medial gonarthrosis a slight overcorrection of 2 to 5 degrees toward valgus leads to better long-term results.



Fig 4: Clinical Picture After 6 month

Clinical knee Score

Pain: None 50, Mild or occasional 45, Stairs only 40, Walking and stairs 30, Moderate -occasional 20: continuous 10, severe 0

Range of Motion

Flexion 5 degree: 1 point, maximum 25 point

Stability (Maximum movement in any position)

Anteroposterior <5 mm 10, 5-10 mm 5, >10 mm 0;

Mediolateral <5 mm 15, 6-9 mm 10, 10-14 mm 5, >15 mm 0

Deductions (Minus) Points 1.Flexion contracture (degrees)
<5 mm 2, 5-10 mm 5, 16-20 mm 10, >20 mm 15.

Extensor lag (degrees) <10 mm 5, 10-20 mm 10, >20 mm 15.

Malalignment (degrees) 0-4 0, 5-10 3 points for each degree
11-15 3 points for each degree

Functional Score

Walking: Unlimited 50, 10 blocks 40, 5-10 blocks 30, <5 blocks 20, Housebound 10, Unable 0.

Stairs: Normal up and down 50, Normal up and down with rail 40, Up and down with rail 30, Up with rail, unable down 15, unable 0.

Subtotal:

Deduction: Cane 5, two canes 10, Crutches or walker

Total Deduction:

If total is minus number than score is zero.

Results

This treatment was performed on 30 patients, with the majority of patients-16 (53.34%) being in the 46-50 age range, and the smallest number-four (13.34%) being in the 51-55 and 56-60 age ranges (in both groups), with the mean age being 49.3 years. In our study, 67% of the patients were female, whereas 33% were male. The average knee society score in our research was 59.86 preoperatively and 91.03 postoperatively. In our study, 24 (80%) had great results, 4 (13.34%) received decent results, and 2 (6.67%) received fair results. There was no significant variation in patient functional outcome based on sex. In this investigation, we identified significant differences in functional outcomes between patients with pre-operative varus angle, union time, and patient age.

Table 1: Age distribution

Age Groups (Years)	No. of Cases	Percent
41-45	6	20%
46-50	16	53.34%
51-55	4	13.34%
56-60	4	13.34%
TOTAL	30	100%

Table 2: KSS results after Post Operative

Results	No. of Cases	Percent
EXCELLENT (80-100)	24	80%
GOOD (70-79)	4	13.34%
FAIR (60-69)	2	6.67%
POOR (<60)	0	0.0%
Total	30	100%

Complicatoin

There were 4 issues in our study when it comes to side effects. One of them was a superficial infection that was treated with a dressing after two weeks without any residual infections; another had a pin loosen, which prevented the patient from putting weight on right away; and two patients had under-correction seen on the post-operative HKA axis scanogram.

Table 3: Post-Operative Complication

Complication	No. of Cases	Percent
Under correction	2	6.67%
Superficial Infection	1	3.34%
Pin Lossening	1	3.34%
Nil	26	86.67%

Discussion

Worldwide, osteoarthritis is the most common articular disease of adults 65 years and older. Osteoarthrosis of knee is the commonest of all symptomatic joint arthroses in Indian subcontinent. The management of this "disease of old age" includes physical therapy, weight reduction and if needed drug therapy. Once the mechanical axis changes from normal,

associated with joint space reduction, no amount of drug or physical therapy has been able to revert these changes. Although a plethora of surgical treatment modalities have been cited in different literature. The aim of the study was to evaluate the results of lateral close wedge High tibial osteotomy with osteosynthesis in medial compartment osteoarthritis of the knee. From June 2021 to October 2022. We treated 30 patients with medial compartment osteoarthritis. The patients age ranged from 40 years to 60 years with the mean age being 49.3 years. The table below shows the mean age group of various studies. It shows that incidence of medial compartment osteoarthritis was common in 6th decade but high tibial osteotomy is a more preferable modality of treatment in age group of 4th and 5th decade. Higher incidence in this age group probably indicates an age related cause for the degenerative changes. The incidence of medial compartment osteoarthritis of knee is most common in women 20/30 (67%) and in 4th decade indicating bone changes due to post menopausal factors. The mean knee society score (clinical) was 59.87 (poor category); this score was increased to 91.03 postoperatively. In different study the complication are infection, pin loosening, correction, intraarticular extension, stiffness, under correction etc, in our study we encountered 1 case with superficial infection, 2 cases with under correction and 1 case with pin loosening. In our study 24(80%) had excellent results, 4(13.34%) had good results and 2(6.67%) had fair results.

Conclusion

In active individuals who are young or middle-aged, HTO is utilised to treat medial knee arthrosis. The ideal patient selection, the ideal osteotomy, and precise surgical techniques are essential for the optimum functional result. In our study, it was shown that lateral closing wedge high tibial osteotomy with osteosynthesis was a physiologically better procedure for treating medial compartmental primary osteoarthritis of the knee. The preliminary results are encouraging for Indian patients who cannot afford the more expensive surgery and implant and who are also reluctant to modify their squatting habits and work profile. We think HTO should be recommended for young, active people with degenerative medial compartment arthritis of the knee in order to relieve symptoms and maintain activity levels. Though complications are there but they are avoidable & treatable. However, it is a small study to conclude anything definitely.

References

1. Devgan A, Marya KM, Kundu ZS, Sangwan SS, Siwach RC. Medial opening wedge high tibial osteotomy for osteoarthritis of knee: long term results in 50 knees. Medical Journal of Malaysia. 2003;58(1):62-68.
2. Helal B. The pain in primary osteoarthritis of knee. Its causes and treatment by osteotomy. Postgrad Med. J. 1965;41:172-81.
3. Pauwels' osteotomy for surgical correction of infantile coxa vara April 2012 Journal of pediatric orthopaedics. Part B / European Paediatric Orthopaedic Society, Pediatric Orthopaedic Society of North America. 2012;21(4):325-30
4. Maquet PV. Valgus osteotomy for osteoarthritis of the knee. Clin Orthop Relat Res. 1976;120:143-148.
5. Coventry MB. Osteotomy of the upper portion of the Tibia for Degenerative Arthritis of the Knee: A Preliminary Report. JBJS. 1965;47A:984.
6. Wolff's law in action: a mechanism for early knee osteoarthritis. Arthritis Res Ther. 2015;17(1):207. Published online 2015 Sep 1. DOI: 10.1186/s13075-015-0738-7
7. Ahlback Sven. Osteoarthrosis of the knee. A radiographic investigation. Acta radiol. 1968;227:7-72.