

HIGH TIBIAL OSTEOTOMY IN MIDDLE AGED MEDIAL KNEE OSTEOARTHRITIS- A CASE SERIES

Orthopaedics

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ABSTRACT

High tibial osteotomy (HTO) is a widely performed procedure to treat medial knee osteoarthritis (OA). High tibial osteotomy produces post operative valgus limb alignment with shifting of load bearing axis of lower limb laterally. We report 5 cases of medial wedge opening of High tibial osteotomy in patients with medial compartment of osteoarthritis. All patients who reported were middle aged presented with pain in knee and isolated medial osteoarthritis with good range of motion and without ligamentous instability. All these patients underwent medial open wedge osteotomy with iliac graft selection with tomofix plates. This procedure resulted in pain relief and correction of deformity. High tibial osteotomy in middle aged people with good range of motion showed satisfactory results at midterm follow up.

KEYWORDS

High tibial osteotomy, medial knee osteoarthritis, medial open wedge osteotomy

INTRODUCTION :

Osteoarthritis of knee is a chronic debilitating disease causing considerable deformity in majority of the cases. Radiological prevalence rates of 10% of men and 18% of women over the age of 45 years have been observed¹. Early degeneration is frequently caused by secondary osteoarthritis (OA) as a result of previous trauma. An increase in the number of patients under the age of 65 undergoing total knee replacement is cause for concern². In patients with symptomatic unicompartmental medial OA and associated genu varus malalignment, high tibial osteotomy (HTO) surgery may be considered to postpone the need for total knee replacement (TKR). High tibial osteotomy (HTO) is a common procedure that yields good results with careful patient selection and precise surgical technique. HTO has clinical indications such as knee varus malalignment associated with Primary or secondary medial knee compartment arthrosis, knee instability, medial compartment overload following meniscectomy, and osteochondral lesions requiring resurfacing procedures³. High tibial osteotomy is a valuable treatment modality in correcting malalignment. Both opening and closing wedge high tibial osteotomy are the most common treatment options of varus malalignment and medial arthrosis of knee⁴.

We present five cases of medial compartment knee osteoarthritis who reported to our institution in a span of 2 years and underwent medial opening wedge high tibial osteotomy and assessed postoperatively.

Case series:

All the patients diagnosed with medial compartment knee osteoarthritis based on clinical and radiological findings and all the patients underwent medial opening wedge high tibial osteotomy.

Case no. 1:

A 34 year old male patient presented to our department with a complaint of pain (VAS 8) in left knee since 2 months. Patient was operated for proximal tibial fracture 2 years ago. Patient had significant varus deformity. Based on radiological findings, patient was diagnosed to be post traumatic medial compartment knee osteoarthritis with significant varus deformity. We performed medial opening wedge high tibial osteotomy. (FIG 1)

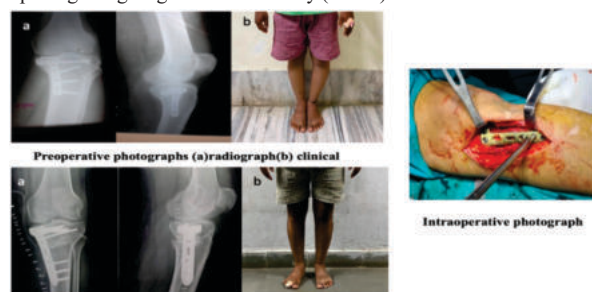


Fig 1.

Case no.2 :

A 46 years old female presented with a chief complaint of pain in right knee since 2 years and increase in pain since 2 months (VAS-8). Patient was housewife by occupation. Radiographically patient was diagnosed as primary right knee osteoarthritis. We performed medial opening wedge high tibial osteotomy. Postoperatively patient had improved results (VAS-2). (FIG 2).

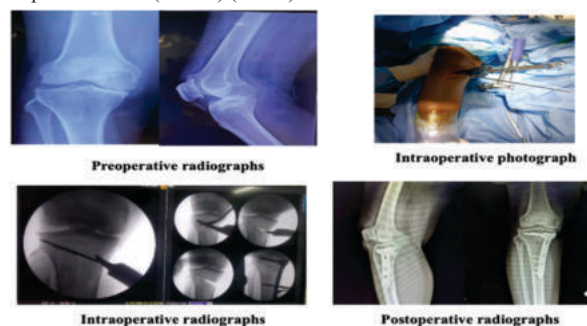


Fig 2 :

Case no.3:

A 32 years old male patient reported to us with a complaint of pain (VAS-6) in his left knee since 3 years. Patient was farmer by occupation. Radiographically patient was diagnosed as primary left knee osteoarthritis. We performed medial opening wedge high tibial osteotomy. Postoperatively patient had improved results (VAS-2). (FIG 3)



Fig 3 :

Case no. 4:

A 40 years old male patient reported with a chief complaint of pain (VAS 8) and instability of right knee since 2 months. Clinically patient had significant varus deformity. MRI was suggestive of complete ACL tear. Based on findings patient was posted for ACL reconstruction. Diagnostic arthroscopy suggestive of intact ACL. ACL was lax because of significant varus deformity, so medial opening wedge high tibial osteotomy was done for the same. (FIG 4)



Fig 4:

Case no. 5:

A 55 years old male patient presented with a complaint of pain (VAS - 6) in right knee since 5 months. Patient gave history of trauma 18 months ago. Radiographically patient was diagnosed with malunited proximal tibia fracture with varus deformity. (fig 5)



Fig 5:

Surgical technique :

10cm anteromedial incision taken over proximal tibia. Skin and subcutaneous tissue dissected, pes anserinus retracted posteriorly, this exposes medial collateral ligament. The long fibres of superficial medial collateral ligament are then detached until posteromedial cortex of proximal tibia is exposed. 3mm guide wire passed from medial to lateral side just above the fibula head. Osteotomy done parallel to the joint line at the apex of the deformity between the two guide wires from medial to lateral side keeping lateral cortex intact. Chisel size 10, 15 and 20 is used and valgus opening is done. Desired amount of correction done using spreader and checked for mechanical axis of limb. Iliac graft is taken and placed in the wedge and checked for mechanical axis of limb. Graft is fixed using tomofix plates.

DISCUSSION :

Knee osteoarthritis is most common joint disorder. The most common deformity seen in knee OA is varus malalignment, which increases the load going through the medial compartment resulting in cartilage degeneration and symptomatic arthritis. For varus alignment and symptomatic medial knee osteoarthritis there are non surgical and surgical options⁷.

High tibial osteotomy effectively treats a variety of knee conditions, including gonarthrosis with varus or valgus malalignment, osteochondritis dissecans, osteonecrosis, posterolateral instability, and osteochondritis dissecans. The procedure's primary aims are to remove aberrant articular surfaces and correct angular deformities at the tibiofemoral joint⁶.

Total of five patients who were of middle aged (35-55 years) reported to us with a complaint of pain in knee. On clinical examination, all the patients had significant varus deformity and medial joint line tenderness (VAS 6-8). On radiological assessment, all the patients were falling in Ahlback's grade I and II. All the patients underwent medial opening wedge high tibial osteotomy with graft fixation using tomofix plates.

The goal of our surgical treatment is medial compartment unloading and medial bone stock restoration, which can favorably allow future arthroplasty. Choi YY et al had good results in patients who underwent medial opening wedge high tibial osteotomy (MOWHTO) with allografts and stabilization using tomofix plates⁷. Kolb et al analysed results of locking plate. They have analysed 51 medial opening wedge osteotomies without bone grafting and found that 50 osteotomies healed at 3 months. Results were excellent in 57%, good in 24%¹⁵.

We assessed postoperative pain by using visual analogue scale (VAS). All the five patients we operated had significant pain relief postoperatively (1 year). 2 patients - VAS - 3, 2 patients - VAS - 2 and One patient - VAS - 1. Outeren et al in 2017 did a 'comparative study on HTO and non surgical treatment in patients with medial knee osteoarthritis' and their study proved high tibial osteotomy was more effective in pain reduction⁸.

All five patients had good range of motion (ROM) after 1 year of follow up. Zhenwu Cao et al in 2018 did a systemic review and concluded HTO group achieved superior Range of motion compared to other surgical procedures⁹.

Postoperatively correction of deformity achieved through the procedure in all patients. Robinson et al, Hee-Soo et al have achieved correction of deformity in their studies done on HTO for medial knee OA^{4,10}.

Song et al have analysed the complications of 90 medial opening wedge and 104 lateral closing wedge osteotomies. They stated that opening osteotomy is associated with lesser complications¹³. Luites et al stated intended correction was achieved more correctly with medial opening wedge technique¹⁴.

CONCLUSION :

"Opening wedge high tibial osteotomy" for medial knee osteoarthritis could provide satisfactory symptomatic relief and good range of motions in middle aged patients.

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