

**Clinical Article**  
**Orthopaedics**

# ROLE OF KUNTSCHER'S NAIL IN MANAGEMENT OF SUBTROCHANTERIC FRACTURES OF FEMUR

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**Abstract:**

Intramedullary implant is now the standard in the treatment of Subtrochanteric fracture of femur however, it is too expensive for the poor patient in developing country like India. The standard K-nail was used to provide a cost effective alternative to the more established but expensive implants. This study was done to evaluate the outcome of Kuntscher's nail for Subtrochanteric fracture of femur with regard to union, infection, limb length and range of motion.

We retrospectively reviewed 55 patients with 58 Subtrochanteric fracture of femur treated with open Kuntscher's nailing. All fractures were simple transverse, short oblique. Patients were discharged from the hospital after 14 days of surgery. Fractures healed within 14-22 weeks and the union rate was 97%. Four patients developed superficial wound infection. Range of motion at knee 100 to 135 degrees at minimum 12months follow up. Varus angulation were seen in 2 patients who had pathological fractures. Four patients had limited knee flexion (less than 50). One patient had bend nail because of early mobilisation.

It was concluded that open Kuntscher's nailing for Subtrochanteric fracture of femur is relevant surgery in the developing worlds with good functional and clinical results in peripheral hospitals without modern instrumentation and image intensifier.

**Key words:** *Subtrochanteric fracture; intramedullary implant; Kuntscher's nail.*

## Introduction

Subtrochanteric fractures of femur are best managed by operative procedures using either extramedullary or intramedullary implants. Extramedullary implants include plates, dynamic condylar or hip screws (DCS or DHS) and Angled blade plates, intramedullary implants commonly used are interlocking nails, proximal femoral nail (PFN). The intramedullary implants have the advantage of being load-sharing and being closer to the weight bearing axis. The modern locked nails often prove to be too expensive for the poor patient in developing country like India. The standard K-nail was used to provide a cost effective alternative to the more established but expensive implants.

## Material and Methods

55 patients with 58 subtrochanteric fractures were managed using Kuntscher's nail in Department of Orthopedics, Rajendra institute of medical sciences, RANCHI from April 2015 till MARCH 2016. The X-rays of the affected thigh with hip were taken in antero-posterior and lateral view. Displacement, pattern of the fracture, comminution and distance of fracture from lesser trochanter was noted. The surgery was performed under spinal anaesthesia. The patient was put in lateral position and through the standard lateral surgical approach K-nail was inserted in retrograde fashion. In some cases stainless steel wire used along with nail for more stable fixation. X-rays were taken to check the placement of nail. Wound was closed in layers after applying suction drain. Active quadriceps exercises and ankle and toe movements were started immediately postoperatively. Straight leg raising and knee mobilizing exercises were

started after stitch removal. Stitches were removed after 13 days. Non-weight bearing ambulation with bilateral axillary crutches was begun at 8 weeks and partial weight bearing was started at 12 weeks post-operatively. Full weight bearing was commenced once radiological evidence of consolidation was seen. At each follow-up, the patients were clinically assessed for infection; nail migration and movements of hip, knee and ankle. Radiographs were taken to assess the progress of fracture healing and implant failure.

## Results

58 fractures in 55 patients (33 males and 22 females), in age group ranging from 20 to 45 years constituted the material for this retrospective study. Associated fractures and medical conditions were evaluated. Fractures were classified as per Fielding classification (Table I). Three patients had bilateral subtrochanteric fractures. All the patients were operated within first two weeks of injury. Operative time ranged from 40 to 50 minutes in unilateral and 75 to 90 minutes in bilateral cases. Clinical and radiological union was achieved within 12 weeks in 10 fractures, within 16 weeks in 33, within 20 weeks in 55 fractures and by 6 months in 56 fractures. Two patients went into non-union. Implant failure in form of nail bend at fracture site was present in one case that started early full weight bearing. 45 patients regained full range of hip and knee movements. 5 patients had limitation of knee flexion beyond 120 and 4 had hip (0-90) and knee (0-50) stiffness.

**Table 1: Fracture classification**

Fielding classification	No.
Type I	0
Type II	34
Type III	24
Total	58

Complications of this procedure Varus angulation were seen in 2 patients who had pathological fractures. The shortening was not reported as severely comminuted fracture was excluded from the study. Proximal migration of nail was found in two cases. Superficial infection was seen in 3 patients and was managed by oral antibiotics uneventfully.



**(Figs:1 Radiographs of 30 yr old patient with Subtrochanteric fracture of right femur (AP View)**



**Fig:2 Same pt as in FIG 1 post op Radiographs of the fracture showing reduction in good position**



**Fig:2 Same pt as in FIG 1 Radiographs 3 months after operation showing sound union of the fracture in good position.**

## Discussion

Many internal fixation devices have been recommended for use in subtrochanteric fractures including extramedullary and intramedullary implant. Intramedullary implants are preferred in comparison to extramedullary ones due to their placement close to the weight bearing axis and hence less stress on the implant and mechanical failure. Verettas et al<sup>1</sup> in a recently reported series in young adults, found that the rate of complications was 22.5% for the trochanteric and subtrochanteric fractures (mal-union and displacement into varus) and was attributed to early collapse of the fracture and the inability of the implant to withstand the strain before osseous union and suggested that intramedullary fixation of subtrochanteric fractures should be preferred to the sliding screw and side plate. Various intramedullary implants have been used for fixation of these fractures at different points of time and include Kuntscher's nail, Ender's nail, Zickel nail, K-Y nail, Interlocking Grosse-Kempf nail, Gamma nail and recently introduced Proximal Femoral Nail. Ender's condylocephalic nail has been used in intertrochanteric and subtrochanteric fractures and has advantage like reduced surgical trauma required for insertion, less blood loss, uniform distribution of stress and better healing potential. However disadvantages like proximal or distal nail migration, loss of fixation and irritation of the knee have virtually kept back many a surgeon from using this implant. Kuntscher's Y nail has been used for improved proximal fixation in subtrochanteric fractures but it is difficult to use and its complication includes coxavara in 10%, external rotation in 13%, implant failure in 7%, migration of nail (Cuthbart et al<sup>5</sup>).

Zickel nail had been designed with the provision of supplementary internal fixation by means of a nail into the head and neck fragments but it has shown problems of intra-operative trochanteric comminution, rotational mal-alignment of the femoral shaft and perforation of the head and neck of the femur (Zickelet al<sup>6</sup>). Brien et al<sup>9</sup> reported 10 malunions and one non-union out of 21 fractures treated by Zickel nail. The Grosse-Kempf nail, which allows the insertion of proximal and distal transfixing or locking screw, has extended the indication for closed intramedullary nailing to subtrochanteric fractures (Kempfet al<sup>10</sup>) But this implant cannot be applied in the fractures above the level of lesser trochanter where varus angulation has been reported in 19% of cases in which it was used. It has also been mentioned that choosing a point of entry of the nail in the greater trochanter too far lateral in subtrochanteric fractures, may lead to fixation of fracture in varus alignment. So it is very demanding procedure and needs experience.

Kuntscher's nail is the cheapest implant with wide availability in the patients with short oblique fractures without comminution, where the nail fits snugly in the medullary canal at the level of isthmus, no locking is needed through the hole. In the cases with comminution or osteoporosis and where the nail is slightly loose in distal fragment, full leg pop slab used 4 weeks to avoid proximal migration of nail and shortening of limb and rotation. The procedure is quite easy and simple and can be well utilized in peripheral hospitals without modern instrumentation and image intensifier. Image intensifier is not required and thus the surgeon and patient can avoid unnecessary radiation hazards. The

only drawback is that weight bearing cannot be allowed for 10 to 12 weeks until callus and healing of fracture becomes evident though the patient can be mobilized in bed.

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