

# Management of Difficult Fractures of Proximal Third of Femur with K Nail In a Secondary Healthcare Facility

Ravikant Das<sup>1</sup>, Pranay Srivastava<sup>2</sup>, Arunesh Singh<sup>2</sup>, Himanshu Sharma<sup>2</sup>

<sup>1</sup>Associate Professor and Head, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS), Bilaspur C.G., Chhattisgarh, India, <sup>2</sup>Assistant Professor, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS), Bilaspur C.G., Chhattisgarh, India

## Abstract

**Background:** Chhattisgarh is largely a tribal state and majority of the people here are poor. Hence, in order to help these poor needy patients, by providing them the best possible orthopedic care, within the economic constraint, this study and effort was made.

**Purpose:** The purpose of this study was, to come up with economical, easy, simple, quick method with least soft tissue dissection (minimally invasive) or closed reduction and internal of fixation of fracture Femur.

**Methods:** A total of 30 cases of fracture Femur were managed with the help of Kuntscher nails (K nails), in the Department of Orthopedics, in Chhattisgarh Institute of Medical Sciences, between December 2002 and January 2005, and cases were followed for 10-12 years for restoration of function and complications or deterioration. K nailing was done by the standard procedure for intramedullary nailing.

**Results:** All the cases healed within 3-6 months of operation. There was a near complete range of hip and knee motion (both active and passive), and a normal gait. The results were similar to internal fixation done with interlocking nailing, in all the parameters including, knee and hip range of movement, both active and passive, thigh and leg girth, muscle wasting, extensor lag and time of union, but the operative time was a half that of interlocking.

**Conclusion:** By this study, it is concluded that K nail is still indispensable implant, and should not be abandoned completely especially in secondary health care centers in developing countries. It is useful in the management of fractures of proximal one-third of Femur, especially in cases where the patient is unable to buy other costly implants due to financial constraint. It should be one of the preferred implants in a secondary health care, government hospital with limited resources, in the hands of even a less experienced surgeon.

**Key words:** Femoral fractures, Intramedullary nailing, Secondary care facility

## INTRODUCTION

In most of the secondary health care centers in India, there is a provision of a single elective operation theatre, but they lack in advanced equipment such as C-arm compatible, Orthopedic operation table with radiolucent top and

traction attachments, fluoroscopic image intensifier unit (C-arm), interlocking nailing sets, locking plate set, and AO femoral distractor etc. Even if they are provided with these equipment, the costly implants in most of the cases have to be bought by the patients. The patients who largely visit these Government run secondary health care centers are very poor,<sup>1</sup> illiterate villagers. Chhattisgarh being a tribal state, they are largely tribal people with little exposure to education and government schemes for their welfare and upliftment, and health care facilities are remotely located and ill-equipped and understaffed.

Chhattisgarh Institute of Medical Sciences (CIMS), a government-run medical college was established in

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**Corresponding Author:** Dr. Ravikant Das, Associate Professor and Head, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS), Bilaspur C.G. - 495 001, Chhattisgarh, India. Phone: +919827184212. E-mail: dravikantdas@gmail.com

November 2001, by the state university, located at Bilaspur, with 100 student admissions a year. It was started in the infrastructure of the existing district hospital.

Kuntscher nail (K nail),<sup>2</sup> Kirschner wire, and stainless steel wires were the only implants provided by the hospital.

K nail was invented by Gerhard Kuntscher (MD). Kuntscher was Professor at the Department of Surgery at Kiel University Hospital in Germany. During the World War II, between 1939 and 1942, Kuntscher worked in Kemi, Finland as the chief medical officer in the German army. There, he used these nails for fixation of femoral fractures of war victims with unprecedented results, and it turned out to be a boon for these morbid and moribund soldiers. During these 4 years, he operated 500 femurs with these nails, and published his research book titled *The Technique of Intramedullary Nailing* in 1945 along with co-author and his Junior, Richard Maatz who was Reader at his Department in Kiel University. This book was forwarded by Thomas A Russell of Campbell Clinic USA, and he wrote that it was one of the most significant contributions to orthopedic surgery and trauma care in the history of medicine!<sup>2</sup>

This worked wonders in the management of femoral fractures for last 5-6 decades until it was improvised as interlocking nail.<sup>3-5</sup> However, we at CIMS were able to prove that it still has a place in developing countries like India and in those patients who cannot afford relatively costly interlocking nail.

Hence, instead of refusing these patients, the required surgery or sending them to tertiary care center which is at least 120 km away. We decided to take them as a challenge and managed them with the available resources.

Hence, we employed K nails for almost any imaginable fracture pattern of proximal one-third of Femur (Figures 1-6) with convincing results.<sup>1,2</sup>

## MATERIALS AND METHODS

Thirty cases of fracture Femur were managed with the help of K nails, in the Department of Orthopedics, in CIMS, from December 2002 to January 2005. There were 23 male and 7 female patients. The age range was between 19 and 68 years with average age of 43 years. 18 cases sustained the fracture due to the road traffic accident, 9 cases due to fall and 3 cases sustained it by assault.

These cases were followed for 10-12 years for restoration of function and complications or deterioration.

This is a retrospective study. Blanket consent was taken from all patients at the time of admission that they are



**Figure 1: Pre-op plain anteroposterior roentgenogram of proximal end of femur in a young male, showing a comminuted four-part fracture of proximal third of femur (AO Type A3-3 trochanteric fracture)**



**Figure 2: Anteroposterior roentgenogram of the same patient in Figure 1, taken 6 months after operation with K nailing and cerclage wiring, showing sound union of fracture fragments in perfect anatomical position**



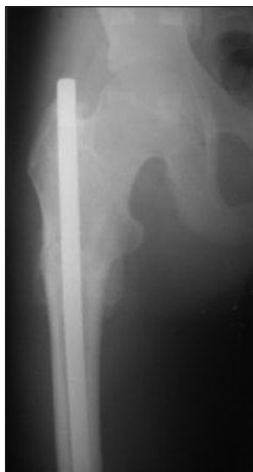
**Figure 3: Anteroposterior roentgenogram of proximal third of femur of a patient showing reverse oblique fracture (AO Type A3-3 trochanteric fracture)**



**Figure 4: Anteroposterior Roentgenogram of proximal third of femur in the same patient in Figure 3, taken 2 months after operation with a K Nail and cerclage wire, showing good reduction and satisfactory callus**



**Figure 5: Anteroposterior roentgenogram of proximal third of femur of a patient showing a fracture of the proximal end. (AO Type A3-2 trochanteric fracture)**



**Figure 6: Anteroposterior roentgenogram of proximal end of femur in the same patient in Figure 5, taken 8 months after operation with a K Nail, showing good reduction and excellent union**

willing for any type of medical or surgical procedure, and that their treatment information would be used for study and research purposes also, warranting them of the complete secrecy of their entrusted personal information.

An Ethical Clearance Certificate was taken from Ethical Committee of our Medical College for this study.

K nailing was done by standard procedure of nailing,<sup>3</sup> applying AO Principles of internal fixation<sup>4</sup> with due emphasis on exact length and thickness of the nail, so as to span the whole length of the bone and should occupy the entire medullary cavity at isthmus, and should achieve three point fixation of the nail in the bone, in order to provide complete rotational stability of the bone and fracture.

## RESULTS

All the cases healed within 3-6 months of operation. There was near complete range hip and knee motion, both active and passive.

It is pertinent to mention here that the C arm image intensifier, fluoroscope was not available at that time in CIMS. Therefore, all these cases were done without it purely relying on clinical and surgical acumen.<sup>1,2,5</sup>

## DISCUSSION

The results were similar to internal fixation done with interlocking nailing<sup>1,2,5</sup> or plating, in all the parameters including, knee and hip range of movement (Figure 7), both active and passive, thigh and leg girth, muscle wasting, extensor lag and time of union, but the operative time was one-third that of plating and half that of interlocking.<sup>1,2,5</sup>

K nailing is still indispensable implant, and should not be abandoned completely<sup>1-3,5</sup> in favor of newer, more advanced, strong and biomechanically more favored implants. The more advanced an implant is, the more sophisticated instruments, equipment, it requires. It also requires greater practice and experience to put them in situ. Whereas, K nail is the simplest of the implants, and if the AO principles of fracture fixation are adhered to strictly, and three point fixation is achieved and the nail is thick enough to occupy whole of the medullary cavity, then it is the most preferred implant in a secondary health care provider, government hospital<sup>1,2</sup> which could manage to get only newly recruited little experienced Orthopedic surgeons. K nail should be an important inclusion in the inventory of implants in Orthopedic surgeon's basket, and sometimes when every other advanced implant



**Figure 7: Clinical photograph of the same patient whose roentgenograms are shown in Figures 5 and 6, displaying the full range of hip and knee, after 8 months of operation. The surgical scar mark can be clearly seen in the patient's thigh**

fails, K nail saves the surgeon and the limb. Especially, in management of fractures of proximal one-third of femur, because most of the time while operating upon a complicated, comminuted fracture pattern especially in elderly osteoporotic patients with many co-morbidities, the surgeon gets very little, anesthesia and surgical time to put in complicated lengthy processed implant, requiring complete inventory of sophisticated instruments and equipment and fully trained and experienced staff<sup>1,2</sup> or in cases where the patient is unable to buy other costly implants due to financial constraint.<sup>5</sup> In such a situation, a K nail serves the purpose and it does not take more than one-fourth to one-third of the total operating time on the limb and it takes only one-third of the time, which is required for plating and half the time required for interlocking.

## CONCLUSION

With this study, we came to the conclusion that K nail is still indispensable implant, and should not be abandoned completely. It is still a boon for those patients who are unable to buy other costly implants, and who cannot travel far and wide for definitive fracture management, due to financial constraint.<sup>5</sup>

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