

MANAGEMENT OF DISEASES OF LONG BONES WITH KUNTSCHER NAILSRavikant Das¹, Vibha Dhruw², A. Singh³, P. Srivastava⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: AIMS: SETTINGS AND DESIGN: The aim of this study was, to devise economical, easy, simple, quick method of fixation of diseased long bones, so that pathological fracture could be prevented and to provide rigid fixation, in those cases which have already developed pathological fracture, and to achieve arthrodesis. Ten, cases of long bone diseases were managed with the help of K nails, in the Department of Orthopaedics, in CIMS, between, December 2002 to January 2005, and cases were followed for about ten years for recurrence, relapse and complications or deterioration of the underlying disease process. **METHODS AND MATERIAL:** K nailing was done by standard procedure of nailing, applying A O Principles of internal fixation 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. **RESULT:** All the cases healed within three to six months of operation. The results were similar to internal fixation done with interlocking nailing or plating, 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 half that of interlocking. **CONCLUSION:** By this study we came to the conclusion that, K nailing is still indispensable implant, and should not be discarded completely. It should be an important inclusion in the inventory of implants in Orthopaedic surgeon basket. Especially in management diseases of long bones, a surgeon has to take care of so many surgical steps that the surgeon is left with very little, anaesthesia and surgical time to put in complicated lengthy processed implant. In such a situation a K nail serves the purpose. Therefore it should be the most preferred implant in a secondary health care, government hospital with a newly recruited Orthopaedic surgeon with very little experience.

KEYWORDS: K Nail, Intramedullary nailing, Bone diseases, Arthrodesis.

INTRODUCTION: In most of the secondary health centres in India there is a provision of a single elective operation theatre, but they lack in advanced equipment's like C-arm compatible, Orthopaedic operation table with radiolucent top and traction attachments, fluoroscopic image intensifier unit (C-arm) and interlocking nailing sets, locking plate set, and AO femoral distracter. Even if they are provided with these equipment's, 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 centres are very poor, illiterate villagers. Chhattisgarh being a tribal state, they are largely tribal people with little exposure to education and government schemes for their welfare & upliftment and health care facilities are remotely located and ill equipped and under staffed.

Chhattisgarh Institute of Medical Sciences (CIMS), a Government run Medical College was established in November 2001, by the state university, located at Bilaspur, with 100 student admission a year. It was started in the infrastructure of the existing district hospital.

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Kunstschers nail and Kirschners wire & stainless steel wires and a few left over screws, were the only implants provided by the hospital.

So instead of refusing these patients, the required surgery or sending them to tertiary care centre which is at least 120 kilometres away. We decided to take them as challenge and managed them with the available resources. So we employed K nails for almost any imaginable Orthopaedic (Bony) disease of long bone with convincing results^{1&2}.

The aim of this study was to devise economical, easy, simple, quick method of fixation of the diseased long bone, so that pathological fracture could be prevented and to provide rigid fixation in those cases which have already developed pathological fracture, which can be employed even by a surgeon with recently acquired Orthopaedic degree with little experience, minimal infrastructure, equipment's and implants and simple post-operative and Physiotherapy protocol.

Ten, cases of long bone diseases were managed with the help of K nails, in the department of Orthopaedics, in CIMS, between, December 2001 to January 2004, and cases were followed for ten years for recurrence, relapse and complications or deterioration.

All mandatory investigations including x-rays, CAT Scans, MRI FNAC, histopathological examination, serological investigations were carried out in all cases as deemed necessary in order to diagnose the disease beyond doubt.

METHODS: K nailing was done by standard procedure of nailing³, applying A O Principles of internal fixation⁴ 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 isthmas, and should achieve three point fixation of the nail in the bone, in order to provide complete rotational stability of the bone and fracture.

CASE. 1:

FIG 1: PRE OPERATIVE RADIOGRAPH, A P VIEW, OF GIANT CELL TUMOUR OF PROXIMAL END OF TIBIA.

FIG 2: PRE OPERATIVE RADIOGRAPH, LATERAL VIEW, OF GIANT CELL TUMOUR OF PROXIMAL END OF TIBIA.

FIG 3: A P VIEW RADIOGRAPH OF GIANT CELL TUMOUR OF PROXIMAL END OF TIBIA, ONE YEAR AFTER OF RESECTION OF THE TUMOUR AND ARTHRODESIS.

FIG 4: LATERAL VIEW RADIOGRAPH OF GIANT CELL TUMOUR OF PROXIMAL END OF TIBIA, ONE YEAR AFTER ONE YEAR OF RESECTION OF THE TUMOUR AND ARTHRODESIS.

FIG 5: CLINICAL PHOTOGRAPH OF THE PATIENT OF GIANT CELL TUMOUR OF PROXIMAL END OF TIBIA, ONE YEAR AFTER RESECTION OF THE TUMOUR AND ARTHRODESIS, SHOWING BEARING FULL WEIGHT ON OPERATED LIMB. IT CAN BE SEEN THAT THERE IS NO LIMB LENGTH DISCREPANCY.

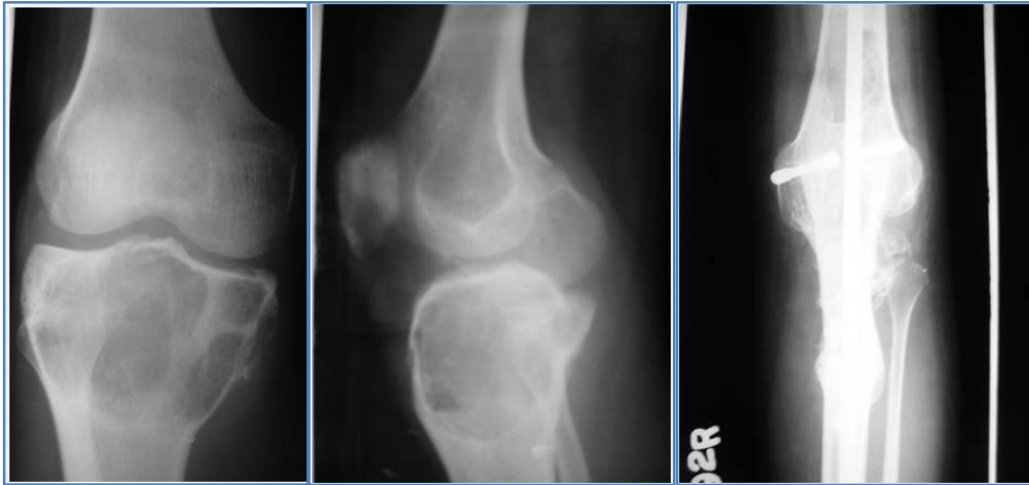


Fig. 1

Fig. 2

Fig. 3



Fig. 4



Fig. 5

Knee arthrodesis after resection of giant cell tumor of proximal end of tibia in a 20 year old tribal lady, wife of a rickshawpuller.

In this case, excision of prox end of tibia along with tumor tissue was done, after establishing the diagnosis beyond any doubt, with imaging modalities and FNAC and ruling out any malignancy, any local and distant metastasis and lymphadenopathy. Distal end of femur was shaved off of articular cartilage. A 72cm, 10mm K nail was inserted from distal end of femur, pulled from tip of greater trochanter, then hammered back to medullary cavity of tibia (Retrograd nailing). Anterolateral quarter of distal femur was rotated 180 degrees and screwed to prox end of tibia. Middle 2/3rd of opposite side fibula was harvested and cut into two and placed longitudinally and secured with screws, autologous cancellous bone graft harvested from iliac crest and put at the junction of bones, so as to promote early bony union. Articular cartilage of Patella was resected and the bone was fixed anteriorly. Union was achieved in 6 months and the patient resumed her activities of daily living. Till then she was advised non weight bearing ambulation with crutches.

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CASE. 2:

FIG 1: PRE OPERATIVE RADIOGRAPH, A P VIEW, OF FIBROUS DYSPLASIA OF PROXIMAL END OF FEMUR WITH A PATHOLOGICAL FRACTURE

FIG 2: POST OPERATIVE RADIOGRAPH, A P VIEW, OF FIBROUS DYSPLASIA OF PROXIMAL END OF FEMUR WITH A PATHOLOGICAL FRACTURE, THREE MONTHS AFTER FIXATION WITH K NAIL AND FIBULAR GRAFT, SHOWING GOOD FRACTURE UNION

FIG 3: POST OPERATIVE RADIOGRAPH, LATERAL VIEW, OF FIBROUS DYSPLASIA OF PROXIMAL END OF FEMUR WITH A PATHOLOGICAL FRACTURE, THREE MONTHS AFTER FIXATION OF K NAIL AND FIBULAR GRAFT, SHOWING GOOD FRACTURE UNION

FIG 4: CLINICAL PHOTOGRAPH OF THE PATIENT OF FIBROUS DYSPLASIA OF PROXIMAL END OF TIBIA, THREE MONTHS AFTER FIXATION OF K NAIL AND FIBULAR GRAFT, SHOWING GOOD RANGE OF HIP AND KNEE FLEXION



Fig. 1



Fig. 2



Fig. 3



Fig. 4

This was a 13 year old, tribal boy with pathological fracture due to fibrous dysplasia. C-arm guided FNAC confirmed it to be Fibrous dysplasia with absence of any malignant cells. Middle 2/3rd of fibula harvested from same limb and slot made in its entire length. It was threaded into the slot of K nail. Then the fibula+nail bundle was nailed into the medullary cavity. No any other type of bone grafting to fill the cavity was done. The fracture united very quickly and in three months there was good union and the child could ambulate with full weight bearing on affected limb.

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CASE. 3:

FIG 1: PRE OPERATIVE RADIOGRAPH, A P VIEW, OF FIBROUS DYSPLASIA OF PROXIMAL END OF FEMUR WITH SHEPHERD'S CROOK DEFORMITY AND UN DISPLACED PATHOLOGICAL FRACTURE.

FIG 2: POST OPERATIVE RADIOGRAPH, A P VIEW, OF FIBROUS DYSPLASIA OF PROXIMAL END OF FEMUR WITH SHEPHERDS CROOK DEFORMITY AND UN DISPLACED PATHOLOGICAL FRACTURE, FIXED WITH A K-NAIL AFTER CORRECTIVE OSTEOTOMY.



Fig. 1



Fig. 2

This was a case of fibrous dysplasia with shepherd's crook deformity. Due to shepherd's crook deformity and continuous weight bearing of deformed femur, the deformity was progressively increasing. Corrective displacement osteotomy was done and medullary cavity was made patent by reaming and

Retrograde K nailing was done with appropriate size nail. The fracture healed in 4 months. The recovery was uneventful.

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^{1,2&5}

TABLE 1: SHOWING DIFFERENT TYPES OF DISEASES OF LONG BONES MANAGED BY K-NAILS.

GCT proximal end of Tibia	3
GCT distal end of Femur	1
Fibrous Dysplasia prox. Femur (without fracture)	2
Fibrous Dysplasia, prox. femur, with fracture	1
Fibrous Dysplasia with shepherd's crook deformity	1
Simple Bone cyst of prox, Femur	1
Osteoid osteoma prox. third of Femur	1

Table 1: Types of diseases of long bones managed by K Nail

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RESULTS: All the cases healed within three to six months of operation. There was complete range hip and knee motion, both active and passive, (In those cases where the nail was used for strengthening a weak bone due to disease, so as to prevent pathological fracture, and in those cases where internal fixation with K nail was done to rigidly fix a pathological fracture) and a normal gait.

In those cases where K nail was used for arthrodesis of the knee, it served its purpose well and the fusion of the joint was achieved in the same time as has been achieved by other methods.

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 one third that of plating and half that of interlocking^{1,2&5}

DISCUSSION: By this study we came to the conclusion that, K nailing is still indispensable implant, and should not be discarded completely^{1,2,3&5} with the advent of newer, more advanced, strong and biomechanically more favoured implants. The more advanced an implant is, the more sophisticated instruments, equipment's, 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 A O 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, government hospital^{1&2} with a newly recruited Orthopaedic surgeons with very little experience.

K nail should be an important inclusion in the inventory of implants in Orthopaedic surgeons basket, and sometimes when every other advanced implants fails, K nail saves the surgeon and the limb. Especially in management of diseases of long bones, a surgeon has to take care of so many surgical steps like curettage, excision, chemical and thermal cauterization, filling of the void thus created with bone grafting, fibula harvest, bone substitutes, lymph node excision, before putting an implant, that the surgeon is left with very little, anaesthesia and surgical time to put in complicated lengthy processed implant, requiring complete inventory of sophisticated instruments and equipment sand fully trained and experienced staff^{1,2&5}. 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 half the time required for interlocking.²

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AUTHORS:

1. Ravikant Das
2. Vibha Dhruw
3. A. Singh
4. P. Srivastava

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor & HOD, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS)
2. Associate Professor & HOD, Department of Radiotherapy, Chhattisgarh Institute of Medical Sciences (CIMS)
3. Assistant Professor, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS)

FINANCIAL OR OTHER

COMPETING INTERESTS: None

4. Assistant Professor, Department of Orthopaedics, Chhattisgarh Institute of Medical Sciences (CIMS)

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ravikant Das,
Associate Professor & HOD,
Department of Orthopaedics,
Chhattisgarh Institute of Medical Sciences (CIMS)
Chhattisgarh-495001.
E-mail: drravikantdas@gmail.com

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