

# A Clinical Study For Evaluation Of Results Of Closed Interlocking Nailing Of Fractures Of The Shaft Of The Tibia

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## Citation

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## Abstract

This is a prospective study of the role of closed interlocking nailing of fractures of the shaft of the tibia in 25 cases aged from 18-54 years, out of which 23 (92%) were males and 2 (8%) were females. The right side was involved in 13 (52%) patients and the left in 12 patients (48%). Motor vehicle accidents were the major cause of the tibial fractures (80%). There were 18 (72%) closed and 7 (28%) open fractures and most of the fractures were either oblique (36%) or transverse (32%) while 20% were comminuted, spiral 8% and 4% were segmental. Reamed closed interlocking nailing was done in most cases under image intensifier. Partial weight bearing was started within the first two weeks in 84% of patients after surgery and full weight bearing was started at 6 weeks. Fracture united in 100% of cases in our series and time of union ranged from 11-28 weeks with the average 14 weeks in 24 cases. Excellent results were found in 18 (72%) cases. In 4 (16%) cases results were good and in two cases results were fair. In one (4%) case result were poor, who had delayed union and deep infection.

## INTRODUCTION

The tibia is the most commonly fractured long bone. The optimal method of treatment for these injuries remains debatable. In spite of all the advances, fractures of the tibia still pose a challenge to the orthopaedic surgeons and thus the management of the fractured tibia requires the widest experience, the greatest wisdom, and the nicest of the clinical judgement in order to choose the most appropriate treatment for particular pattern of injury. That is why Sir John Charnley long back spoke rightly that "we have still a long way to go before the best method of treatment of fractures of the shaft of the tibia can be stated with finality". Since the advent of intramedullary fixation it has undergone several modifications specially the advent of locking which has widened the rather limited indications of unlocked nailing. When operative fixation is indicated locked I.M. nail at present appears to be an attractive surgical option, as it is the only operative modality closest to the safe yet rewarding and time honoured conservative treatment. The intramedullary interlocking nail can be solid or hollow type and can be used either in static or dynamic mode, may be reamed or unreamed, but however the ideal technique remains a matter of controversy. Presented here is a clinical study for evaluation of results of closed interlocking nailing of fractures of the shaft of the tibia in 25 cases done in the

post graduate department of orthopaedics, GMC, Jammu.

## MATERIAL AND METHODS

This is a prospective study of 25 cases of fractures of the shaft of the tibia treated with interlocking nail over a period of 2 years in the Post graduate Department of Orthopaedics, Govt. Medical College, Jammu.

Criteria for selection of patients are;

AGE; patients in age group of 16 years and above with fresh fractures of the tibia shaft were taken up for closed interlocking nailing as primary treatment.

TYPE OF FRACTURE:

1. Simple tibia fractures and Gustilo type I and II compound fractures were included in the study.
2. Radiological all types were included.

## OPERATIVE PROCEDURE

The interlocking nailing was carried on under general or spinal anaesthesia and the position of the patient was spine on normal operation table with knee flexed to 90° and hip to 45°. An image intensifier was used to access the reduction, to check position of guide wire and nail and for locking. An

insertion point in line with medullary cavity was made after giving midline incision at tibial plateau splitting patellar tendon in middle. After doing reduction and passing guide wire to distal fragment with the help of image intensifier, the proximal fragment was reamed. The nail was inserted through the entry portal over the guide wire in the medullary canal and position and length of nail was checked with image intensifier.

Proximal locking was done with the help of insertion handle while as distal locking was done with free hand technique.

**POST OPERATIVELY**

Quadriceps exercises, knee bending exercises and ankle movements were started soon after the patient was comfortable and was progressed to partial weight bearing and full weight bearing according to the tolerance of the patient, fracture pattern, associated injuries and progress of healing of fracture. Full weight bearing was started when there was radiological and clinical evidence of healed fractures. Dynamisation was done if there was no evidence of callous formation or when there was distraction of the fragments after primary static fixation and was done between 6-12 weeks. Patients were followed every 4 weeks till a minimum period of 6 months.

**EVALUATION OF RESULTS**

Excellent

- Normal function
- No post operative complication
- No remaining symptoms

Good

- Sound bony union in normal position and alignment without shortening.
- Minor postoperative complication
- Occasional discomfort during certain activities like squatting and some joint activities.

Fair

- Prolonged discomfort
- Bony union in good position but with shortening of more than 2cms.

- Nail bending, angulations more than 10\*.
- Poor
- Moderate loss of function
  - Deep infection
  - Shortening more than 2cms , fracture of nail.

**OBSERVATION**

In our study 11(44%) patients were in age group of 21-30 years and 8(32%) were in between 31-40 years. In our study most of the fractures occurred in males 23(92%) compared to female 2(8%). Road traffic accident as a mode of injury were responsible for most of the fractures 20(80%) followed by fall in 4(16%) cases and direct blow in 1(4%) case. Most of the fractures were oblique 9(36%) cases, followed by transverse 8(32%) cases , comminuted 6(24%) cases, spiral 2(8%) cases and segmental 1 (4%) case. In our series tibial shaft fractures occurred middle third in 14 (56%) cases , lower third in 10(40%) cases and upper third in 1 (4%) case. 18 (72 %)cases were simple and 7 cases (28%) were due to open fractures , out of which 5 (20%) were grade I and 2 (8%) were grade II. Right side leg fractures 13(52%) were more common than left side 12 (48%). In our study 6 (24%) cases were associated with other injuries.

**Figure 1**

Table no.1: Post operative complications

POSTOPERATIVE COMPLICATIONS	NO. OF PATIENTS	PERCENTAGE
Superficial infection	1	4
Deep infection	1	4
Delayed union	1	4
Non union	-	-
Deformities	1	4
Shortening(>1.5 cm)	-	-
Reduced range of motion of knee joint	1	4
Knee pain	2	8
Ankle pain	-	-
Pain at screw site	1	4

Post operative complication in our cases were 1 (4%) each of superficial and deep infection, 2 (8%) patient had anterior

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knee pain and 1(4%) each of delayed union, deformity, decreased knee movements and pain at screw site(Table 1).

10(40%) patients were bearing weight in 1<sup>st</sup> week, 11 (44%) patients in 2<sup>nd</sup> week and 4(16%) patients at the end of 4<sup>th</sup> week( Table 2).

### Figure 2

Table no. 2: Start of partial weight bearing.

TIME IN WEEKS	NO. OF PATIENTS	PERCENTAGE
0-1	10	40
1-2	11	44
2-4	4	16

In our study 4 (16%) cases united in 9-12 weeks , 17 (68%) cases united in 13-16 weeks , 3 (12%) cases united in 17- 20 weeks a and 1 (4%) case after 20 weeks(Table 3).

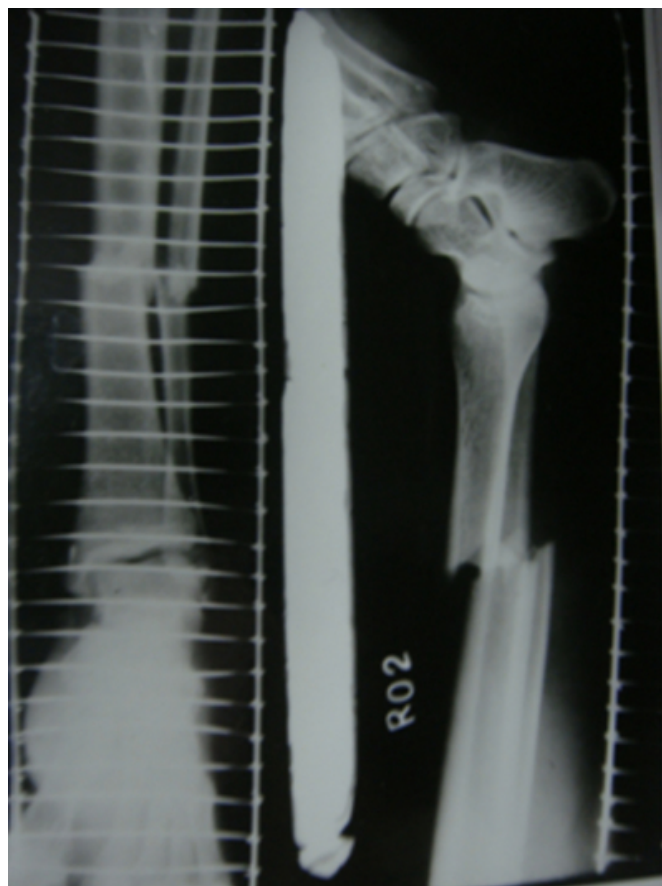
### Figure 3

Table no. 3:Time of union.

TIME OF UNION IN WEEKS	NO. OF PATIENTS	PERCENTAGE
9-12	4	16
13-16	17	68
17-20	3	12
>20	1	4

### Figure 4

Fig 1: Preoperative x- ray



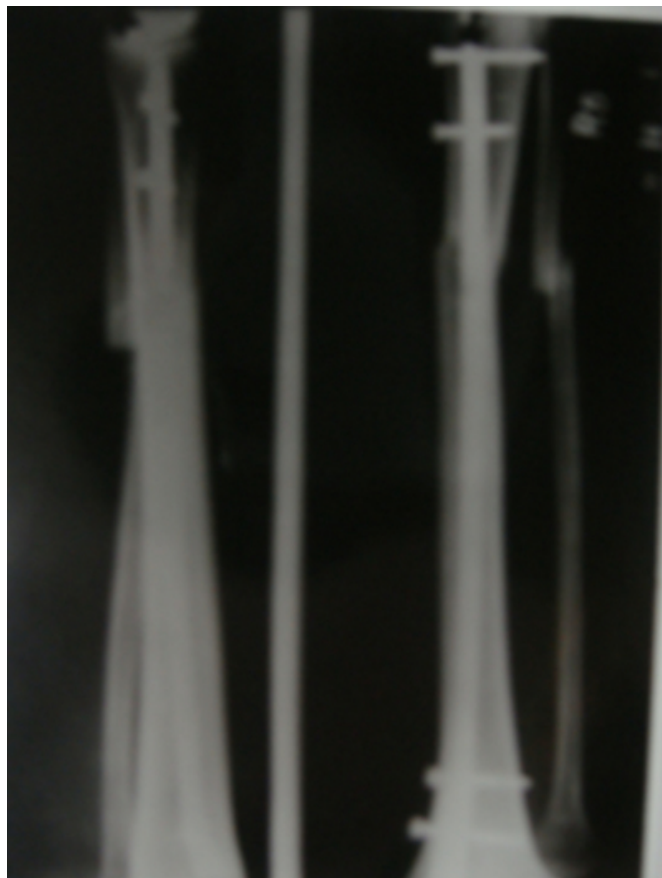
**Figure 5**

Fig 2:Postoperative x-ray



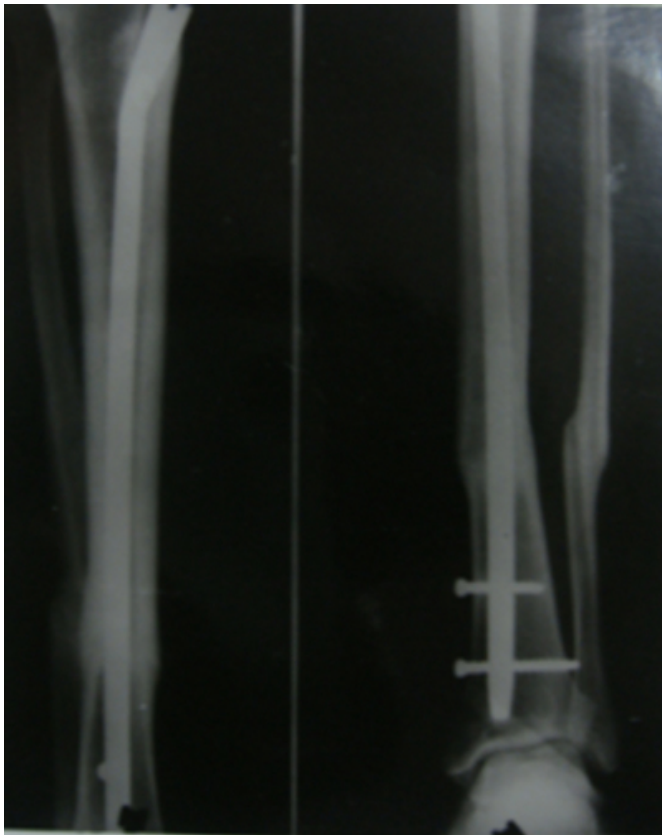
**Figure 6**

Fig 3:Postoperative radiograph showing callus formation



**Figure 7**

Fig 4: Radiograph showing union



## DISCUSSION

Introduction of interlocking nails in the treatment of fracture tibia has widened the scope of closed nailing. It can be used in most type of fracture shaft of tibia like segmental, comminuted with or without bone loss and open fracture. Short morbidity, early weight bearing, early range of motion excises and correction of axial, angular and rotational deformity are advantage. Comparing our results with other reported series is difficult due to lack of standardization of fracture and number of different grading system. The maximum number (76%) patient in our study were from the young and active stage of life 21-40 years and it was comparable to other series like Bone et al(1986) (average age 31 years), Hanley (1989) average age of 33 years and Alho et al(1990) have median age of 35 years in his series. Wiss (1986) reported 81 (75%) males and 27(25%) females out of 108 patients while as in our study out of 25 cases 23 (92%) were males and 2(8%) were females. During the study it was found that the road traffic accident were the common cause of fracture shaft of tibia (80%) and 4 (16%) were due

to fall while as in Wiss (1986) series of patients 84% of the fracture was due to automobile accidents. In our study results of type and morphology of fractures were comparable to results of Hooper et al (1991). In our study the results of level of fracture, side involved, associated injuries and postoperative complications were comparable to the other studies like Puno et al (1986), Hooper et al and Bone et al.

## CONCLUSION

We here conclude from our study that closed interlocking nailing appears to be promising method of treatment of unstable shaft fractures in adults without any external splintage after adequate stabilization and early weight bearing leading to excellent functional results in most of cases. This implant leads to an extremely low rate of infection and alignment with early mobilization and decreased limitation of motion of knee and ankle joint.

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