The Journal of
Maharashtra Orthopaedic Association
December - 2005

# Interlocking Nailing For Distal Metaphyseal Tibial Fractures

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**Key Words**

Distal tibial fracture - Treatment by Distal tibial nail.

Fibular stabilization is also advocated.

Early mobilization.

**❖ Abstract ❖**

Distal tibial fractures are notorious for healing. Various modalities are advocated like close reduction with POP, Open Reduction with plating, Biological plating, or External fixator. Every method has more demerits than merits. Problems of open reduction are many like soft – tissue dissection, infection, delayed union or non-union.

This is an era of close technique. Close interlocking nailing with routine AO tibial nails does not give stability as the medullary canal in distal fragment is wide and only one interloking screw can be passed. This leads to improper reduction leading to malunion.

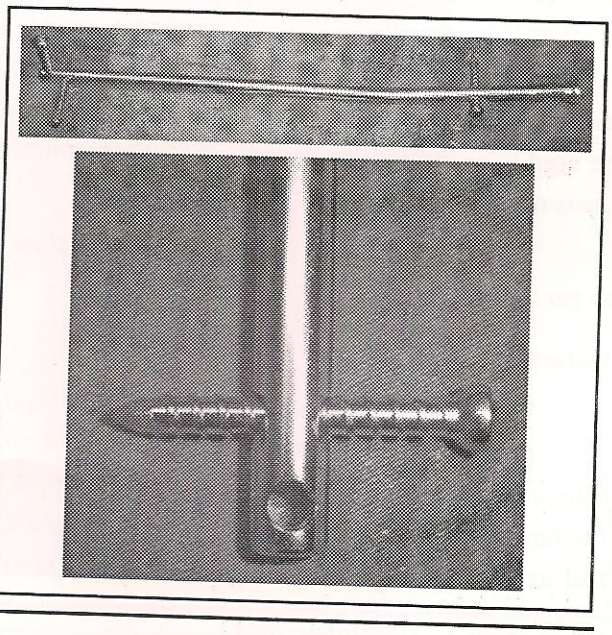
Newer Distal Tibial Nails (DTN) are designed in such a way that the distal interlocking holes are at right angles to each other and the distal most interlocking hole is 3 mm proximal to the distal end of the nail. This nail gives good stability for these fractures. It is also advocated to stabilize fibular fractures which add to the stability *i.e.*, Lateral column fixation.

Fifteen such patients wear treated by this method. Ninety percent of fractures united in average period of ten weeks with good function of ankle & knee. All these patients are mobilized early.

**Text**

Treatment of fractures in distal end of tibia is always a challenge to Orthopaedic Surgeon. The goal of management of this fracture is to provide stable fixation with minimal soft tissue injury. This is an era of close technique & pendulum is swinging towards close interlocking intramedullary fixation of fractures. This type of fixation is biologically sound & biomechanically stable. Various designs of nails are being developed for different fractures, *e.g.*, supracondylar nail for supracondylar fracture femur, P F N for proximal femoral fractures, Recon nails for ipsilateral fracture neck & shaft of femur, proximal tibial nail for fracture in the proximal end of tibia. Distal tibial nail is developed for fractures in distal end of tibia.

**Distal Tibia Nail (DTN) :** It is a normal A O tibial nail having a modification at distal end. The two interlocking holes in distal end are at right angles



to each other. The most distal interlocking hole is 3 mm proximal to distal end of nail, is in antero-posterior direction & proximal distal interlocking hole is in medial to lateral direction i.e. at right angle to distal interlocking hole. Thus, we can use this nail in distal tibia fractures located within 5 cms of the ankle joint. With these two interlocking holes in distal end of tibia at right angles to each other, the distal end of the fracture can be stabilized well.

### Techique

The operative technique is like AO inter-locking tibia naling with some precautions.

**1.** This fracture needs good reduction by manipulation to get anatomical alignment. This reduction should be confirmed in A. P. & Lat. Plane on C-arm.

**2.** The guide wire should be in the centre of distal end of fracture in A.P. & Lat. plane.

**3.** The reaming should be up to subchondral bone in distal end of tibia.

**4.** Proper sized tibial nail should be used & it should reach till subchondral bone at distal end of tibia.

**5.** For distal most locking, we have to take proper precaution and the soft tissue should be protected well to prevent bursa formation anterior to ankle, so that it should not restrict the ankle movements.

**6.** In case the guide wire or the nail is not centering properly in distal end, Pollar wires should be used to centre the guide wire & thus the nail in the centre of distal fragment.

**7.** It is always better to stabilize fibula fracture to get stability *i.e.,* lateral column fixation.

### Materials & Methods

This prospective study deals with fifteen cases of distal tibial fractures. Six Factures were transverse, Five fractures were oblique, Four fractures were spiral and comminuted. One patient had associated fracture of medial malleolus and another had fracture extending in ankle joint. Thirteen were simple & two fractures were grade I compound. All these fractures were fixed by using DTN, where two locking bolts were used distally & only one locking bolt in dynamic hole proximally. Fibular fractures were also fixed by close method by using L wires.

Post-operatively all these patients were ambulated with walking aids & toe touch gait was started as soon as pain & swelling reduced. All these paitents were followed up every three weeks till bony union & then function of the limb was assessed.

### Results

In Thirteen patients, fractures united well within an average period of eight weeks to ten weeks & in one patient the fracture showed signs of delayed union which united after bone marrow injection, at the end of twenty weeks. One fracture showed signs of infection around the distal locking bolt which took six months for union & lead to some restriction of ankle movements due to periarticular fibrosis.

### Discussion

Interlocking nailing of tibial shaft fracture has been associated with high rates of radiographic & clinical success but the use of this procedure has not become widely accepted in distal metaphyseal fractures. The distal segment of the fracture is more difficult to control with intramedullary implants because of the metaphyseal flare above the plafond. In addition, the poorer soft–tissue coverage in this region is associated with wound complications. The age old modalities like close reduction POP., Open reduction with plating, Biological plating, External fixators are having high incidences of complications like restrictions of joint movements due to prolonged immobilization, malunion, nonunion, infection, etc.

Use of Distal tibial nail for the fractures in distal tibial metaphysis is biologically & biome-chanically sound, gives better stability & maintains tissue biology leading to early union of fracture & early mobilization.

**Illustrations**

**1. Mr. Narayan Awashank, a 50 yrs. Male pt with communited fracture.**

Pre-op.


Post-op.


After Union

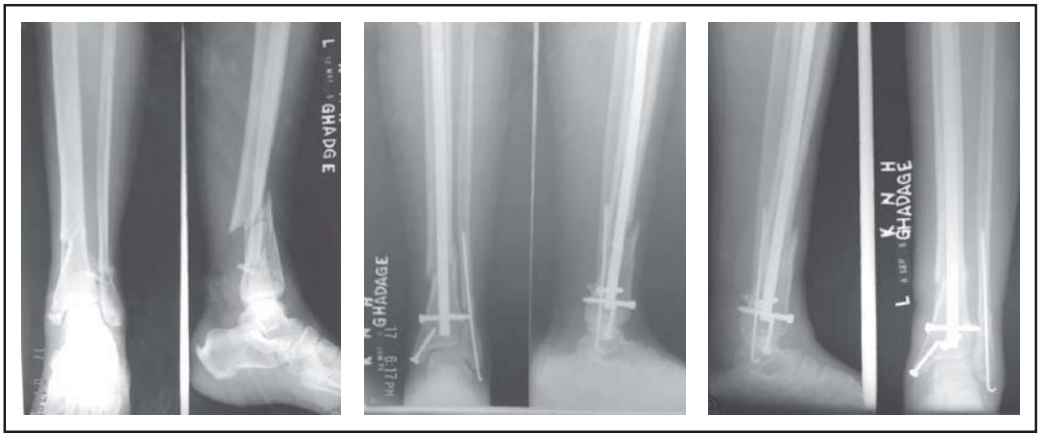

After consolidation


Post-op movements

**2. Mr. Ganesh Mandhania, A 57 yrs. Male pt. with long spiral fracture.**

**3. Arjun Waghamare, a 38 yrs male pt., fracture involving ankle.**

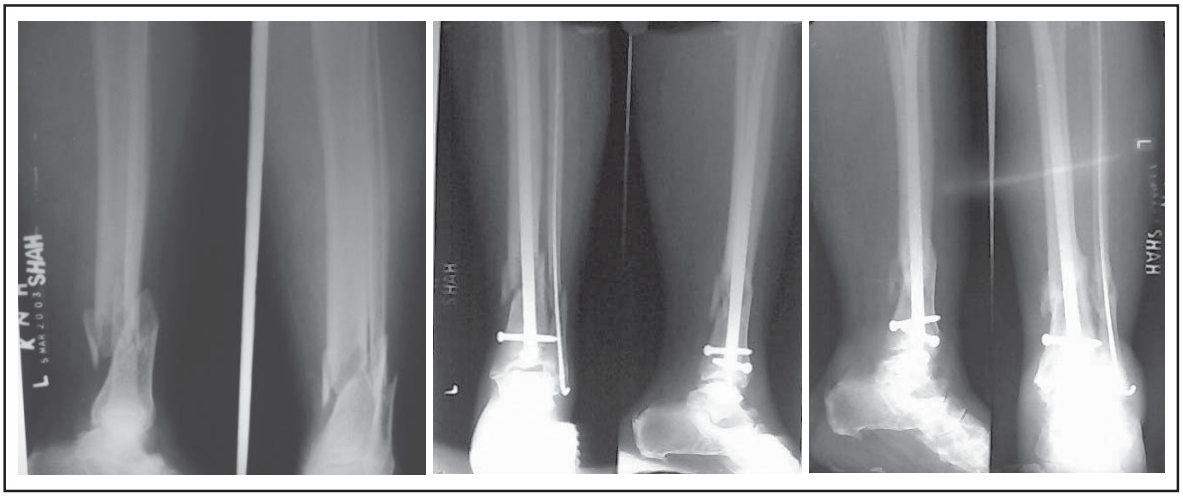
**4. Mr. Ghadage a 31, yrs male pt. Grade I compound with fracture medial mallous.**



**5. Mrs. Maya Bhutte, a 39 yrs female pt. needed marrow injection.**


**6. Mr.Pathan, 55 yrs male pt., communited fracture, grade I compound.**


**7. Mrs. Shah, 68 yrs. Female pt., with diabetes & hypertension.**



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