



## Assessment of expert tibial nailing with distal tibial plating in patients with distal one third extraarticular tibial fractures

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### ABSTRACT

**Background:** Shortened IM nailing is an effective alternative for the treatment of distal metaphyseal tibial fractures. The present study was conducted to compare expert tibial nailing with distal tibial plating in patients with distal 1/3rd extraarticular tibial fractures.

**Materials & Methods:** 50 patients of extraarticular distal 1/3rd tibia fractures were divided into 2 groups with 25 patients in each group. Group I were treated with expert tibial nailing and group II with distal tibial plating. Patients were followed up for 6 months after operation and evaluated as per Johner and Wruss Criteria.

**Results:** Group I and group II, mean operative time (minutes) was 83.2 and 101.5, intraoperative blood loss (ml) was 52.6 and 88.4, post-operative full weightbearing time (weeks) was 8.4 and 14.2 and fracture union time (weeks) was 18.3 and 25.3 in group I and II respectively. The difference was significant ( $P < 0.05$ ). Johner – Wruss scoring system in group I and group II was excellent seen in 18 and 15, good in 4 and 5, fair in 7 and 3 and poor in 0 and 2 respectively. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Tibial interlocking nailing found to be effective as compared to plating for the management.

**Key words:** Tibia, interlocking nailing, tibial fractures

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### Introduction

The tibia constitutes one of two bones of the leg. Since it is weight-bearing bone, it is suggestively superior and tougher in comparison to fibula. The proximal component of the tibia comprises of a medial and lateral condyle.<sup>1</sup> These join to form knee joint's inferior portion. Intercondylar portion lies in between the two condyles. It is this particular area where the anterior cruciate ligament, posterior cruciate ligament, and menisci have their attachments. The tibial

shaft is tersely widened at its higher end to support the condyles.<sup>2</sup> Fractures of the distal tibia are distressing because these occur mainly because of high-energy mechanisms and vehicles. Because of the complex nature, fractures of distal tibia and pilon are difficult to manage. In combination with crucial bone injury, the adjacent soft tissue components often become severely traumatized.<sup>3</sup>

The treatment of distal metaphyseal tibial fractures remains controversial. Shortened IM nailing is an effective alternative for the



treatment of distal metaphyseal tibial fractures. This involves removing approximately 1 cm just distal to the lowermost locking screw. It has been known for years now that one distal locking screw is insufficient and two are needed.<sup>4</sup>

Also, MIPO has over the years proven to be just as effective as IMN in treating mid diaphyseal fractures of the tibia.<sup>5</sup> Moreover, surgical wounds heal better with MIPO than IMN with better soft tissue coverage, reducing recovery time and postoperative pain, thus allowing for expedited rehabilitation.<sup>6</sup> Anterior knee pain, a major drawback of IMN, can also be avoided as a whole with the MIPO technique.<sup>7</sup>The present study was conducted to compare expert tibial nailing with distal tibial plating in patients with distal 1/3rd extraarticular tibial fractures.

**Materials & Methods**

The present study comprised of 50 patients of extraarticular distal 1/3rd tibia fractures of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. All the patients were divided into 2 groups with 25 patients in each group. Group I were treated with expert tibial nailing and group II with distal tibial plating. All the patients underwent procedures. During the postoperative phase, static quadriceps exercises & toe movements, as tolerated were started from 1st postoperative day. Full weight-bearing was allowed after 10 to 12 weeks. Patients were followed up for 6 months after operation and evaluated as per Johner and Wruss Criteria. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

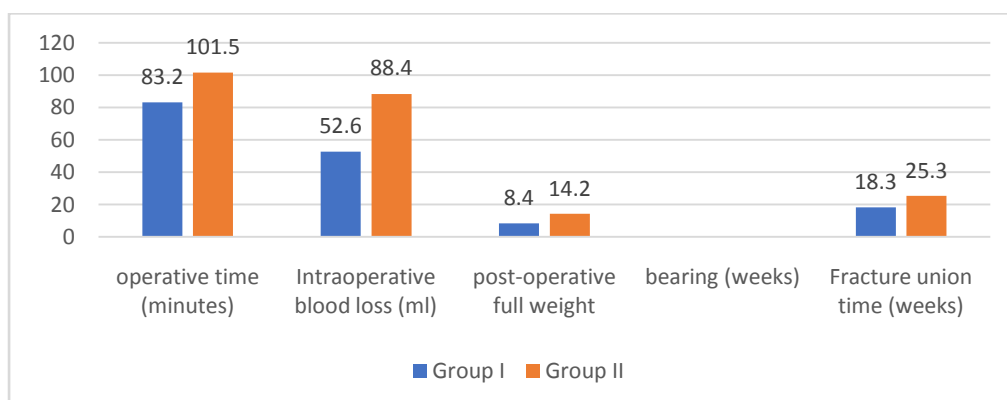
**Results**

**Table I Assessment of parameters**

| Parameters                                 | Group I | Group II | P value |
|--|---------|----------|---------|
| operative time (minutes)                   | 83.2    | 101.5    | 0.03    |
| Intraoperative blood loss(ml)              | 52.6    | 88.4     | 0.01    |
| post-operative full weight bearing (weeks) | 8.4     | 14.2     | 0.05    |
| Fracture union time (weeks)                | 18.3    | 25.3     | 0.04    |

Table I, graph I shows that in group I and group II, mean operative time (minutes) was 83.2 and 101.5, intraoperative blood loss (ml) was 52.6 and 88.4, post-operative full weightbearing time (weeks) was 8.4 and 14.2 and fracture union time (weeks) was 18.3 and 25.3 in group I and II respectively. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**



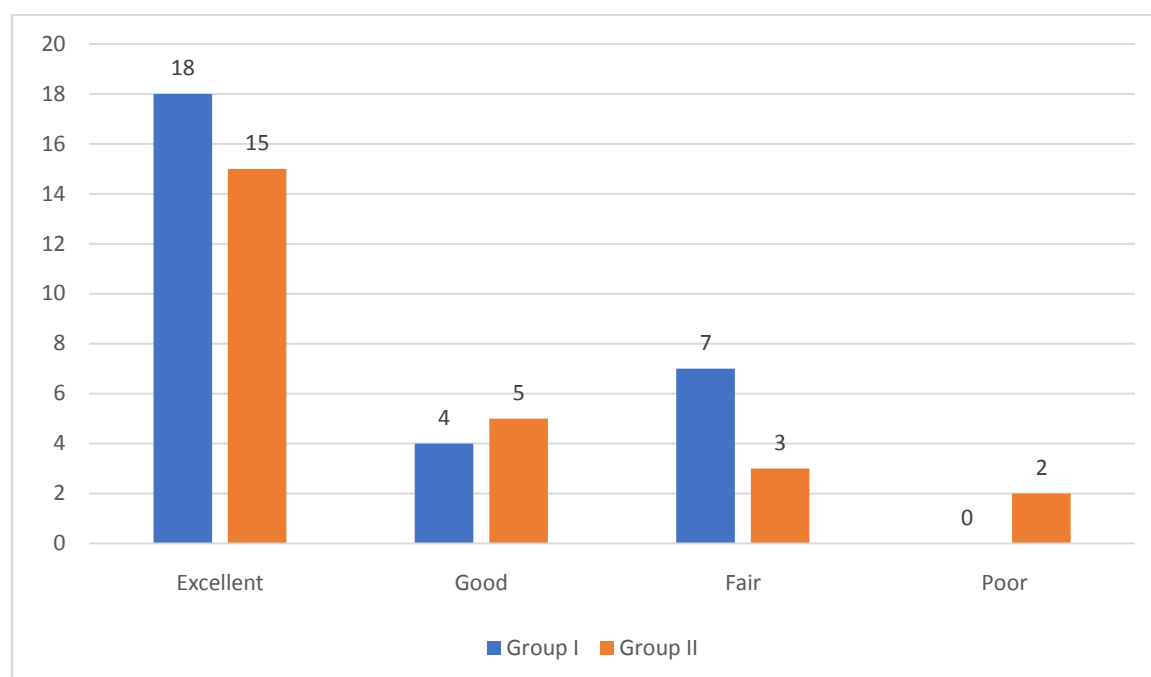
**Table II Outcome of treatment**



| Johner – Wruss scoringSystem | Group I | Group II | P value |
|------------------------------|---------|----------|---------|
| Excellent                    | 18      | 15       | 0.91    |
| Good                         | 4       | 5        | 0.82    |
| Fair                         | 7       | 3        | 0.05    |
| Poor                         | 0       | 2        | 0.01    |

Table II, graph II shows that Johner – Wruss scoring system in group I and group II was excellent seen in 18 and 15, good in 4 and 5, fair in 7 and 3 and poor in 0 and 2 respectively. The difference was significant ( $P < 0.05$ ).

### Graph I Outcome of treatment



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### Discussion

Fractures of the distal tibia occur commonly, afflicting all ages. On one end of the spectrum, low-energy falls generate torsional spiral fractures of the metaphysis and distal diaphysis, whereas, on the other extreme, the high-energy blunt impact causes complex comminuted fractures.<sup>8,9</sup> Even with the least severe fractures, the overlying soft tissue envelope is problematic because the anteromedial cortex of the tibia is subcutaneous.<sup>10</sup> The present study was conducted to compare expert tibial nailing with distal tibial plating in patients with distal 1/3rd extraarticular tibial fractures.

We found that in group I and group II, mean operative time (minutes) was 83.2 and 101.5, intraoperative blood loss (ml) was 52.6 and 88.4, post-operative full weightbearing time (weeks) was 8.4 and 14.2 and fracture union time (weeks) was 18.3 and 25.3 in group I and II respectively. Obremsky WT<sup>11</sup> found that group I (n = 39) patients were stabilized with an intramedullary nail by community orthopedic surgeons. Group II (n = 18) patients were treated by orthopedic trauma surgeons. In Group I (community), 9 (23%) patients treated by the community surgeons exhibited >5 degrees of angulation in at least one direction. Five (13%) of these patients displayed angulation in more than one direction, and 3 of these patients exhibited

>10 degrees of angulation. In Group II (trauma) 1 (5%) patient had >5 degrees angulation in any plane ( $P < .05$ ). No differences were noted in time to union, non-union, delayed union, hardware failure or infections between the two groups. Functional outcomes were assessed using the MODEMS lower limb module. In comparison of the patients with and without significant angulation. Patients treated by the community orthopedic surgeons had a higher incidence of malalignment, as compared to those treated by orthopedic trauma specialists.

We found that Johner – Wruss scoring system in group I and group II was excellent seen in 18 and 15, good in 4 and 5, fair in 7 and 3 and poor in 0 and 2 respectively. Singla et al<sup>12</sup> compared the results of Expert Tibial nailing with results of Distal Tibial Plating in patients with Distal 1/3rd extraarticular Tibial Fractures. All the patients were divided into two study groups randomly with 20 patients in each group as follows: Expert Tibial Nailing group, & Distal Tibial Plating group. The mean age of the patients of the expert tibial nailing group and distal tibial plating group was 48.12 years and 49.71 years respectively. Mean operative time among the patients of the expert tibial nailing group was 83.15 minutes and was significantly lower in comparison to the patients of the distal tibial plating group (101.2 minutes). Mean intraoperative blood loss was compared between expert tibial nailing and distal tibial plating. Tourniquet was used in all the cases. Mean intraoperative blood loss among the patients of the expert tibial nailing group was 51.6 ml and was significantly lower in comparison to the patients of the distal tibial plating group (89.1 ml). Mean postoperative weight-bearing time among the patients of expert tibial nailing was 8.95 weeks and was significantly lower in comparison to the patients of the distal tibial plating (14.35 weeks). Mean fracture union time among the patients of the expert tibial

nailing group was 18.6 weeks and was significantly lower in comparison to the patients of the distal tibial plating group (25.84 weeks). Excellent results were obtained in 80 percent of the patients of the expert tibial nailing group and 55 percent of the patients of the distal tibial plating group respectively.

## Conclusion

Authors found that tibial interlocking nailing found to be effective as compared to plating for the management.

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