

# Comparison of Outcome in Reamed Vs Unreamed Nailing in the Treatment of Tibial diaphyseal Fracture

ISHFAQ AHMAD, MUHAMMAD KAMRAN SHAFI, MALIK ISHFAQ

## ABSTRACT

**Objective:** To compare the outcome (union) between reamed and unreamed nailing in tibial diaphyseal fracture (transverse).

**Material and methods:** This randomized study was carried out in the Department of Orthopedic Surgery, Nishtar Hospital, Multan from January 2009 to September 2009. Two hundred and ten patients were divided into two groups A and B. Group A patients were managed by reamed interlocking tibial nail and group B patients by unreamed interlocking nail tibia. Follow up was done up to 3 months and outcome union was compared between both groups.

**Results:-** Union was achieved in 80% patients of group a while 70% in group B.

**Conclusion:** Our study suggests that there is no significant difference between reamed interlocking tibial nail and unreamed interlocking tibial nail. Although there is trend towards improved union with reamed interlocking nailing

**Keywords:** Tibial diaphyseal fracture, interlocking nail tibia, reamed, unreamed

## INTRODUCTION

Nicoll has stated, "Fractures of tibia are important for two reasons. The first is that they are common the second that they are controversial and anything that is both common and controversial must be important<sup>1</sup>". A long period of convalescence is inherent even to an uncomplicated healing course of notorious fracture<sup>2</sup>. Both conservative and surgical techniques have been introduced in an effort to speed time to union while minimizing the occurrence of complications such as residual deformity, consolidation problems, refracture, infection, compartment syndrome, peripheral nerve injuries, anterior knee pain, joint stiffness and vascular complications.

Intramedullary locking nail has gained numerous advocates in the treatment of both closed and open tibial shaft fracture<sup>3,4</sup>. This present study was undertaken to compare clinical and radiological outcome of interlocking nail with and without reaming.

## MATERIAL AND METHODS

This randomized study was carried out in the Department of Orthopaedic Surgery, Nishtar Hospital, Multan from January 2009 to September 2009. Two hundred and ten patients were divided into two groups A and B. Group A patients were managed by reamed interlocking tibial nail and group B patients by unreamed interlocking nail tibia. Follow up was done

Department Orthopaedic, Nishtar Medical College/Hospital, Multan

Dr. Muhammad Kamran Shafi Senior Registrar Email: Shafi-75@yahoo.com Cell: 0321-6864243

up to 3 months and outcome union was compared between both groups. Eligible patients fulfilling the inclusion criteria were recruited and they were explained about study procedure and purpose in brief and their informed consent was taken.

## RESULTS

A total of 210 patients of tibial diaphyseal fracture were enrolled. The ages were ranged from 20 to 45 years, majority of patients fell in age group 30-45 years. Duration of fracture was 0-14 days. Out of 210 patients, 156 (86.7%) were male while 24 (13.3%) were female. So male to female ration is 6:1 (Table-1). Follow up of both groups were done at 3 months. Fifteen patients were dropped out from both groups. Patients who completed their follow up were included in analysis. After 3 months group-A patients were having union 80% while group-B were having 70% ( $p=0.121$ , chi square = 2.400).

Table 1: Gender distribution

Gender	=n	%age
Male	156	86.7
Female	24	13.3

Table 2: Union (percentages)

Union	A	B	Total
Yes	72(80%)	63(70%)	135(75%)
No	18(20%)	27(30%)	45(25%)

Table 3: No of dropouts

Total	Completed follow-up	Drop outs
210	180	30

## DISCUSSION

Tibia is currently the most fractured long bone in the body because of high speed trauma such as motor vehicle accidents. The presence of hinge joints at the knee and the ankle allows no adjustment for rotary deformity after fracture, and thus special care is necessary during reduction to correct such deformity. Delayed union, nonunion and infection are relatively common complications of tibial shaft fractures<sup>5,6</sup>.

Operative treatment is indicated for most tibial fractures caused by high energy trauma. Operative treatment allows early motion, and avoids complications associated with immobilization. The goals of treatment are to obtain a healed, well aligned fracture, pain free weight bearing and functional range of motion of the knee and ankle joints. The optimal treatment method should assist in meeting these goals while minimizing complications, especially delayed union or non union<sup>7</sup>.

Various studies regarding the safety and effectiveness of closed Intramedullary interlocking nailing have been done. Locked Intramedullary nailing currently is considered the treatment of choice for most types I, II and IIIA open and closed tibial shaft fractures and is especially useful for segmental and bilateral tibial fractures<sup>8</sup>.

The fact that intramedullary reaming damages the endosteal blood supply has been appreciated for many years. However, recent work has quantified the extent of the damage. Klein et al showed that reaming of the canine tibia diminished the cortical blood supply by 45 to 85%, whereas use of unreamed nails was associated with a 15 to 30% reduction<sup>9</sup>. Schemitsch et al noted that cortical revascularization of sheep tibiae took up to 6 weeks after unreamed nailing, compared with 12 weeks after reamed nailing<sup>1</sup>. Reichert et al however took a contrary view, suggesting that reaming is actually beneficial to fracture union<sup>10</sup>.

Court BC et al undertook the first prospective study of reamed and unreamed nails in straightforward closed tibial fractures and showed that reamed nails were associated with a lower union time and less secondary surgery than unreamed nails<sup>3</sup>. There was also a higher incidence of screw breakage and malunion in the unreamed group and it was their conclusion that the use of unreamed nails in straightforward closed tibial fractures should be abandoned. More recently, other surgeons have corroborated their results<sup>11</sup>.

Sadowski et al showed that patients treated with unreamed nails had a significantly longer union time, a higher incidence of non-union<sup>4</sup>. A higher rate of screw breakage and a significantly greater number of

secondary procedures than patients treated with a reamed nail.

Blachut and associates randomized 136 closed tibial diaphyseal fractures to treatment by reamed and unreamed nailing. Mean age was 35 years with motor vehicle being the cause of injury in 40% patients. In 73 patients treated with reamed nailing 7 patients had delayed union while 3 patients were having non union.

Keating et al carried out a prospective trial comparing reamed and unreamed nails in open tibial fractures<sup>10</sup>. They randomized 94 patients with 96 fractures to treatment with either a reamed goose Kempf nail or an unreamed Delta nail. They analysed their results in detail and showed no significant difference in the incidence of compartment syndrome, infection, malunion, or patient function. The time to union for the different fracture types was similar and the only significant difference was in the incidence of implant fracture where they noted a 7% incidence of screw breakage in the reamed nails, compared with 27% in the unreamed group<sup>12,13</sup>.

In our study group-A patients have a success rate of 80% while group-B have 70%. Some authors reported union in 96% to 100% of fractures treated by reamed nailing<sup>14,15</sup>, while studies by others court reported union rate of 80 to 100% of fractures<sup>16,17,18</sup>. Our study indicates that patients who underwent unreamed nailing have slightly prolonged healing time as compared to reamed nailing but statistically it is not significant.

Keeping all above discussion in mind it is still difficult to decide that which modality will be the first line therapy for management of tibial diaphyseal fracture in our study reamed interlocking nail is slightly better option through clinically not significant as compared to unreamed interlocking nail. However we feel that a multicentric study is needed to reach at a definite conclusion.

## CONCLUSION

In our study there was no significant difference between reamed and unreamed nailing in the management of tibial diaphyseal fracture for outcome i.e. union. Although there is trend towards improved union with reamed nailing but statistically it was not proved in our study.

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