



“OUT COME OF REAMED AND UNREAMED NAILING IN CLOSED TIBIAL SHAFT FRACTURE - AN OBSERVATIONAL STUDY”

Orthopedics

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ABSTRACT

Tibial shaft fractures are one of the commonest long bone fractures encountered by most of the orthopaedic surgeons. Most common mode of injury is road traffic accidents. Young and middle-age people are most commonly affected. The present study was undertaken to observe outcome of 30 patients with tibial shaft fracture operated with intramedullary nailing with or without reaming 15 patients in each group (A&B). Patients were followed up for minimum of 6 months. Functional Results evaluated as per Ketenjian and Shelton Criteria modified by Yokoyama et al.

CONCLUSION: In this study we concluded that in closed tibial shaft fractures Intramedullary nailing was the best treatment method. Results of the study concluded that reamed IM nailing had advantage over unreamed IM nailing in the terms of early weight bearing and early union.

KEYWORDS

INTRODUCTION:

In India there is increasing number of vehicles on the roads so progressively trauma cases caused by traffic accidents have increased. Usually indirect injuries are caused by low energy and direct injury is usually high energy⁽¹⁾. Young and middle-age people are most commonly affected with tibial shaft fractures. In long bone fractures due to its superficial location tibial fractures are more common⁽²⁾. Lack of soft-tissue envelope and precarious blood supply of shaft of the tibia make these fractures more prone to infection and nonunion^(3,4). The option for skeletal stabilization method of tibial shaft fractures continues to be debatable. The aims of treatment for tibial shaft fractures are low complication rates with re-establishing pre-injury function and anatomy. Treatment options are cast immobilization, open reduction and internal fixation by plates, external fixator and intramedullary nailing. Goals for the successful outcome of treatment to prevent the infections, to achieve the bony union and the restoration of function. These goals are usually achieved in chronological order. Immobilization in a plaster cast, fixation with plates and screws has yielded unacceptably high rates of infection. External fixation has the disadvantages due to bulky frames and frequent infections in pin tract having non-unions and mal-unions and poor patient compliance.⁽⁵⁾ Intramedullary nails like Ender nails, due to insertion without reaming having low rates of postoperative infection but unable to stabilize comminuted fractures because there is more chances for shortening of limb or displacement of fractures around these nails.⁽⁶⁾ Locking of intramedullary nails of the proximal and distal fragments decreases the risk of mal-union and provide stability. Use of intramedullary nailing in the treatment of tibial shaft fractures has advantages such as, preservation of the periosteal blood supply and closed reduction, increased chances of early mobilization of the ankle and knee joint, easy to observe limb postoperatively, a low incidence of wound infections when soft tissue envelope is poor, good possibility for bone union good biomechanical stability of the cortical bone, and a early recovery for work.⁽⁷⁾ There is an ongoing controversy for choice between two alternative intramedullary nail insertion technique reamed or unreamed. In reaming tibial nailing technique there is about 70% reduction of cortical blood flow while in unreamed tibial nailing technique there is only 30% reduction of cortical blood flow, but also reaming also increases periosteal blood supply. In reamed nailing normal cortical vascularity obtained in 12 weeks while in unreamed nailing time taken to normal cortical vascularity is 6 weeks⁽⁸⁾. Some studies proved that reaming debris contains vital osteoblasts which promote fracture healing when present at and in the fracture site⁽⁹⁾. In unreamed nailing method osseous blood supply of bone preserved so there is chances to improve fracture-healing and the risk of infection decreases. But unreamed nails are smaller in size so smaller bolt and screws therefore less strong and less stable. In reamed nailing method there is use of larger nails so osseous blood supply destructs, but gives greater stability to bone⁽¹⁰⁾. Fractures of the tibia

cannot be treated successfully in all cases with only one approach or a single simple set of rules.

Material and Methods

This study was prospectively conducted in the Department of Orthopaedics of Maharishi Markandeshwar Institute of Medical Sciences, Mullana, Ambala, on 30 patients with isolated closed fracture of tibial shaft during the period (January 2016-may 2017) selected between age 18-60 years of age. Patients were treated surgically using reamed/unreamed intramedullary interlocking nailing. Patients were divided into two groups consisting of 15 patients in each group. Group A patients were operated using closed intramedullary interlocking with reaming and group B without reaming for fracture stabilization. Further follow-up was done at 2,4,6, 12 and 24 weeks and each patient was individually assessed clinically and radiologically. Patients were followed up for minimum of 6 months.

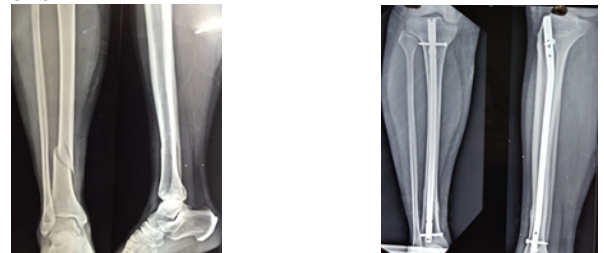
CASE 1



POST OPERATIVE

FOLLOW UPSIX MONTH

CASE 2



PRE OPERATIVE

FOLLOW UPSIX MONTH

Observations

Age distribution:

In this study the average age of all cases was 37 years, In reamed group (A) average age was 37.07 years, in unreamed group(B) average age was 37 years.

Sex distribution:

In this series total number of patients 30, which 70% were male and 30% were females showing male preponderance.

Partial weight bearing:

In this study almost all patients started partial weight bearing within two weeks postoperatively 80 % of Group A patients and 60 % of group B patients. Except those had complex fracture and associated injury and co-morbidities which delayed partial weight bearing. Average partial weight bearing time for group A was 2.06 weeks and for Group B 2.46 weeks.

Dynamization:

In current study there were 4 patients who needed dynamization secondary in statically locked nails after 8-10 weeks because callus was not evident in x-ray and dynamization done to promote fracture union and to avoid screw breakage. Dynamization done in 2 patients of Group A and 2 patients of Group B.

Complications:

In our series there were 2 incidence of superficial infection one in Group A and one from Group B, one patient had delayed union which was from group B. One incidence of static bolt breakage which was from Group B. There was no evidence of compartment syndrome, deep vein thrombosis, mal-union, non-union in our study.

Knee pain:

In our series 6 patients had knee pain 3(20%) from Group A and 3(20%) from group B. 4 patients had occasional knee pain 2 from group A and two from group B. Two patients had knee pain on activity one from each group.

Knee and ankle range of motion:

In our series there was total 22 patients had normal knee range of motion 12 group A and 10 from group B, there were 2 patients from group A and 4 from group B had Knee range of motion 75%. One patient from each group had knee range of motion 75-50%. There were 25 patients had normal ankle range of motion 13 from group A and 12 from group B. There were 2 patients from group A and 3 patients from group B had ankle range of motion 75->75%.

Union time:

In current study average union time in all patients was 13.87 weeks; for group A it was 13.47 weeks and for group B it was 14.27. Most of the fractures 23 (76.67%) united in time period of 14 weeks, in group A 12 (80%) and in group B 11(73.33%). In group A one fracture united at 16 weeks, one at 18 weeks and one at 20 weeks of time. in group B two fractures united at 16 weeks, one at 18 weeks and one united at 26 weeks of time period.

Results:

In our study total 19 (63.33%) patients had excellent results 10(66.67%)from group A ; and 9 (60%) from group B, there was 9(30%) patients had good results in which 4 from group A and 5 from group B. in both groups there is one patient who had fair results

DISCUSSION

The optimal management of tibial shaft fractures continues to be a problem with several unanswered questions. Those fractures, usually caused by high energy trauma, have numerous problems resulting from the poor soft tissue coverage and limited vascular supply of the tibia, cause mal union, non-union, delayed union There are two major factors related to the lesion that alter the final outcome of tibial shaft fractures. The first is the severity of the fracture, characterized according by the degree of initial displacement, comminution and soft tissue injury. Accordingly, the more severe the fracture, the higher the rate of complications and the longer the periods of healing will be whatever the method of fixation used.

Each method had specific advantages and disadvantages and controversy still continues regarding which method is warranted for

specific clinical situations.

In our series there were 2 incidence of superficial infection one in Group A and one from Group B, one patient had delayed union which was from group B. One incidence of static bolt breakage which was from Group B. There was no evidence of compartment syndrome, deep vein thrombosis, mal-union, non-union in our study.

In 2004 Larsen LB et al,⁽¹¹⁾ did a study in 45 patients in which there were 2 cases developed mal-union, 1 incidence of fixation failure and no incidence of delayed union out of 22 in reamed group and in unreamed group 4 cases of mal-union,3 cases of fixation failure, 4 cases of compartment syndrome and 3 cases of delayed union out of 23, there was no infection case reported in their study.

In 2011 Gaebler C et al,⁽¹²⁾ done a study of 100 patients 50 were in reamed group and 50 in unreamed group reported 1 case of fixation failure,5 cases of infection in reamed group and 5 cases of fixation failure,4 cases of infection reported in unreamed group.

In current study average union time in all patients was 13.87 weeks; for group A it was 13.47 weeks and for group B it was 14.27. Most of the fractures 23 (76.67%) united in time period of 14 weeks, in group A 12 (80%) and in group B 11(73.33%). In group A one fracture united at 16 weeks, one at 18 weeks and one at 20 weeks of time. in group B two fractures united at 16 weeks, one at 18 weeks and one united at 26 weeks of time period.

In 2004 Larsen LB et al,⁸⁰ held a study on 45 patients in their study there is average union time in reamed group was 16.7 and in unreamed group 25.7 weeks. Another study by Gaebler C et al,⁹⁴ in 2011 show average union time in reamed group was 17 weeks and in unreamed group it was 19 weeks

CONCLUSION

Following conclusions can be drawn from the observation and analysis during the course of this study as compare to reamed and unreamed in this study, average time of partial weight bearing is early in reamed nailing. Average full weight bearing time also less in reamed nailing group as compare to unreamed group. There is one incidence of static bolt breakage in unreamed group and no incidence in reamed group. Infection rates are same in both groups. One patient of unreamed group had delayed union.

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