

INTRAMEDULLARY INTERLOCKING NAILING WITHOUT IMAGE INTENSIFIER AND ORTHO TABLE

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ABSTRACT... Interlocking nails are the gold standard treatment of fractures of shaft of long bones of lower limbs. It is also frequently performed for most of the humerus fractures. The procedure is commonly performed using an image intensifier and orthotable. These are expensive and are not readily available in peripheral/field hospitals especially in resource – poor countries. **Design:** Retrospective study. **Setting:** Field Hospital Muzaffarabad and Combined Hospital Kharian. **Period:** Sep 2007 to July 2011. **Patients & Methods:** 138 consecutive cases of fractures of femur, tibia and humerus shafts fixed with I/M I/L Nails in a field hospital. Reduction was achieved by open method in 87 (96.66%) cases of femur, 24 (60%) case of tibia and 5(62.5%) of humerus. **Results:** There were 34 females and 100 males' ratio 1:2.94. All the cases were adults with mean age 38.2 years and range was 16-78 years. Bones fixed were femur (90) 65.21%, tibia (40) 28.21%, and humerus (8) 5.70%. Fracture line was transverse in 104 (75.3%) and comminuted 10 (7.2%). Fractures were closed 112 (81.2%) and 26 (18.8%) of case. Recent fractures were 122 (88.4%) and old non united 16 (11.6%). Mean follow up period was 06 months - range 3 months to 1 ½ years. Complications were failure to achieve distal interlocking 6 cases, infection 3 cases. Union time averaged 3.5 months. **Conclusions:** It is therefore concluded that I/M I/L nailing can be done without image and traction table.

Keyword: I/M Intramedullary, I/L Interlocking, Ortho Orthopaedics, I/V intravenous.

INTRODUCTION

Fractures involving the shaft of long bones are quite common. Their frequency has increased in past two decades because of high velocity¹. The methods used to achieve skeletal stabilization vary considerably, depending on the configuration of fracture line and geographical location of the surgeons' practices⁷. Traditionally internal fixations used were rush nails, kuntshner nails, Dynamic compression plates and screws. However fixation with interlocking nails has become the gold standard for lower limb especially over the past two decades⁸.

Interlocking nails has been increasingly used to treat both fresh and old fractures of long bones. These are performed using an image intensifier and ortho/traction table¹. Image intensifiers are expensive and are not readily available in peripheral hospitals of resource poor countries of the world. A simple technique was developed and found useful in treating these fractures without intra-operative use of Image and ortho table. We used slight over reaming, distal jigs, matching nails and proximal

sleeve direction to find the distal interlocking screw holes and confirming them intra operatively by trans-nail guide wire hitting the drill bit and screws.

PATIENT & METHOD

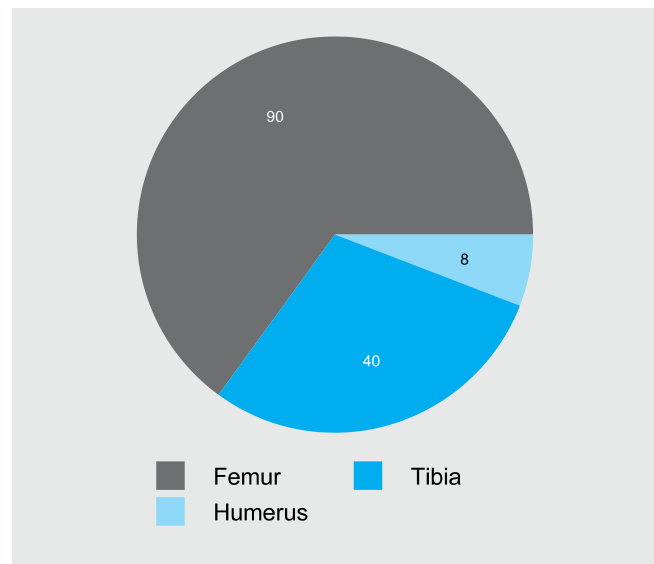
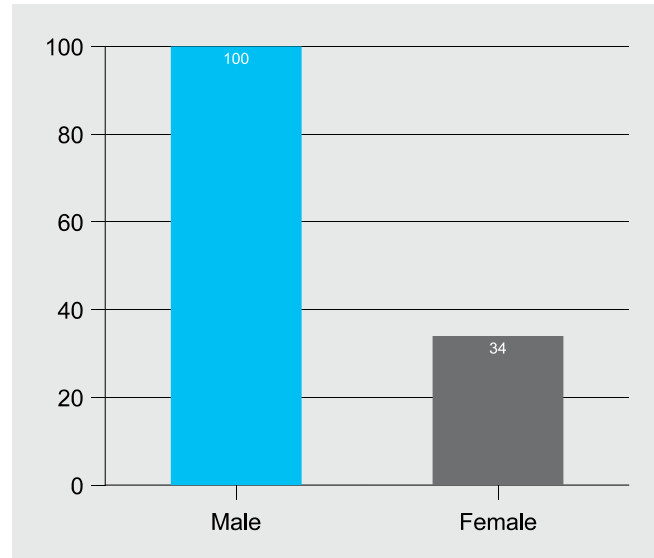
This retrospective study was conducted at field hospital Muzaffarabad and Combined Hospital Kharian from Sep 2007 to July 2011. Total no. of 138 cases of fracture shaft of femur, tibia and humerus were operated. Informed consent of the patients was obtained for open reduction and fixation without image. I/L Nailing was done either in closed fractures or clean open fractures Gustillo I or II. Pre- op x-ray was obtained of the bone involved including proximal & distal joints. Length of the Nails was calculated by measuring the normal side of the patient while diameter of the nail was measured per operatively and with the help of x-rays film. Reduction was achieved by open method in almost all cases of femur and in about 60%, cases of tibia and humerus. Distal interlocking slots were found by using distal jigs, and matching nails overlap, reaming 2 mm higher than the diameter of the nail selected to reduce the nail

distortion while inserting and paralleling the drill with proximal screw sleeve. Confirmation of drill bit inside the slot of the screw was confirmed by hitting the drill bit with a trans-nail guide wire and repeating the same while inserting the screws. Distal of the distal interlocking screws was passed first and confirmed and then proximal of the distal screws was passed and confirmed again. Impaction at the fracture site was applied by distracting the nail a little and then proximal locking screws were passed and confirmed. All patients received prophylactic antibiotics during and after operation. (Inj. Augmentin 1.2 gm I/V 8hrly and Inj. Amikin 500mg I/V 8hrly). All patient had check X-rays on the evening of the operation. Early physiotherapy and early weight bearing was encouraged. No cast or brace was applied. Patient was generally discharged on the 4th post op day. Fracture union was assessed clinically and radiologically at 6 wks and 12 wks and than 4 weekly. The fracture was considered united when there was no pain or tenderness at the fracture site, no abnormal movement could be elicited at the fracture site and bridging callus was visible on a plain radiograph.

RESULTS

Total no. of 138 bones were fixed with I/M I/L nails, 04 patients had double bone fractures. 130 patients had single bone fracture. There were 34 females (25.37%) and 100 male (74.63%) giving a ratio of 1:2.94. The mean age of the patients was 38.2 years and the range was 16-78 years. The distribution of the involved bones was femur 90% (65.21%), tibia 40 (28.98%) and humerus 08 (5.79%). Configuration of the fracture line includes 104 transverse (75.2%, 24 oblique (17.3%) and 10 communitied (7.2%). Closed fractures were 81.2% and open fractures were 18.2%. In all cases ante-grade approach was used. Recent fractures were 122(88.4%) and old (non-united / mal-united) fractures were 11.6%. The methods of reduction employed were open 84% (in femur 96%, in tibia 60% and in humerus 62%) and closed 16%. Closed method was used in thin lean patients where fracture segments were palpable and reduced by closed method and fracture line was transverse.

Correct position of the guide wire was confirmed by gritty sensations. Complications include failure to place distal interlocking screws in 6 cases (4.35%) superficial



infection in 3 cases (2.18%), delayed union was 4cases (2.9%) wasting of quadriceps muscles 3 cases (2.18%). Mean follow-up period was 6 months (range 3 months-1 ½ years). Average time of union was 3 ½ months.

DISCUSSION

High velocity trauma is the most common cause of morbidity and mortality in the modern world¹. High velocity trauma is becoming more and more common. Long bone fractures are common after road traffic accidents. Most of the peoples are between 20-50 years which is the most productive period of life². Males are affected more because of the obvious reasons. Fixing the

Reduction			
Open	87 (96.66%)	24 (60%)	5 (62.5%)
Closed	03 (3.33%)	16 (40%)	3 (37.5%)
	90	40	08

Mean Operating Time	
Femur	58 min
Tibia	40 min
Humerus	45 min
Follow up	6 months
Union time	3.5 months

long bones of lower limbs with intra-modularly interlocking nails has almost become the gold standard treatment ensuring the early return of the victims to their functional life⁹. This needs the use of intra-operative image intensifier and traction table. Image intensifiers are very expensive and not always available in a peripheral hospital especially in resource-poor countries. Practicing the appropriate treatment modality by orthopaedic surgeons even under such conditions is indeed highly desirable¹¹. In this study 138 fractures of long bones were fixed with I/M I/L nails over the period of 02 years in a peripheral hospital without image and traction table. Satisfactory results were achieved along with the advantage of technical simplicity.

Complications were few and mild. There were three cases of superficial wound infection which was treated with extended antibiotic cover.

There were 04 cases of delayed union and three of them occurred in distal 1/3 of tibia and one in femur. Femoral case was already non-united after a broken DCP which was also infected. Out of 03 delayed unions for tibia one was non-united already and one was for mal-union. Two cases of screw loosening were noticed because of severe osteoporosis. There was no case of nail or screw breakage in this study. Independence from image intensifier not only decreases the harmful effects of radiation to patients, assistants and orthopaedic surgeons but also reduce the operating time. The biggest

disadvantage is that in most of the cases open reduction had to be done. However the union time in such cases was comparable to that achieved by closed method¹⁰.

CONCLUSIONS

Interlocking intra-medullary nailing which is standard treatment for long bone fractures of lower limb can also be done without image intensifier and orthopaedic table. It reduces the operating time and exposure to radiation is avoided. Though in most cases open reduction is to be done but union time and rate remain acceptable. Complications were few in this study and within the acceptable limits and quality of treatment is not compromised.

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PREVIOUS RELATED STUDIES

- Mansoor Ilyas, Mohammad Idress, Siafuddin Tareen. INTERLOCKED INTRAMEDULLARY NAILING OF LONG BONES. (Original) Prof Med Jour 15(4) 449-454 Oct, Nov, Dec, 2008.

Calendars are for careful people,
not passionate ones.

Chuck Sigars