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ORIGINAL ARTICLE

A STUDY ON ROLE OF INTERLOCK NAILING IN THE MANAGEMENT OF TIBIAL DIAPHYSEAL FRACTURES

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ABSTRACT: Tibial fractures are one of the commonest orthopedic injuries. Tibial fractures are one of the commonest orthopedic injuries. In the past several years there has been a trend towards by use of small diameter nails without remaining in the management of unstable tibial shaft fractures. However it is important to remember that many closed fractures with less severe soft tissue injury, Treatment with an intramedullary nail with reaming allows placement of larger implant, thereby minimizing the incidence of mechanical failure. While maintain high rates of union. **METHODS:** In our study, 100 cases of tibial diaphyseal fractures were treated with Interlocking nailing in between May-2012 to April 2015 at Siddhartha Medical College/Government General Hospital, Vijayawada. **RESULTS:** In our study, among 100 cases 86 were closed fractures, and 8 were open fractures and 6 non-unions. Of the 100 cases 56 (56%) on right side, 38 (38%) on left side, 6 cases (6%) were bilateral. The commonest type of fracture is spiral or long oblique in 40 cases (40%). Transverse or short oblique in 28 cases (28%), comminuted in 24 cases (24%) and segmental in 8 cases (8%). The average time for union is 14 weeks with a range of 12-40 weeks. . 2 patients developed delayed union due to distraction at the fracture site.

KEYWORDS: Interlocking nailing tibia, fracture tibia shaft.

INTRODUCTION: Tibial fractures are one of the commonest orthopedic injuries. By its very location it is frequently exposed to injuries. These fractures continue to pose vexing problems for orthopedic surgeons, because of their common occurrence and morbidity. One of the problems among them is selecting the optimal method of treatment. They can't be managed by simple set of rules. According to Nicoll [1] tibial shaft fractures are important for two reasons. Firstly they are common, secondly their management is controversial. The incidence of tibial fracture is 9 times more than femoral fractures. Modern treat ment of tibial fractures include both operative and non-operative management, which allow near normal functional restoration of the extremity.

It is incumbent on the orthopedic surgeon to be skilled in a variety of treatment methods including, closed functional cast bracing, external skeletal fixation, open reduction and internal fixation using indirect reduction techniques, intramedullary nailing. Because the spectrum of injuries to the tibia is so great that usually no single method is applicable to all fractures. With recent advances in metallurgy (Cold curing, variety of metals) and design of the nails such as prebent nails, prefabricated holes in nails, which lock fragments with screws have made trauma surgeon more confident in a dealing with these fractures. At present interlock nailing seems to be ideal method of treatment of tibial diaphyseal fractures. Sarmiento and co-workers,[2] documented their experiences with functional bracing in the successful management of closed tibial fracture. However, not all tibial fractures are amenable to brace treatment. It is of more value in the treatment of closed low-energy injuries. Functional bracing is also associated with complications like difficult reduction, loss of reduction, repeated manipulation and cast wedging, shortening, angular deformities.

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In the past several years there has been a trend towards by use of small diameter nails without remaining in the management of unstable tibial shaft fractures. However it is important to remember that many closed fractures with less severe soft tissue injury, Treatment with an intramedullary nail with reaming allows placement of larger implant, thereby minimizing the incidence of mechanical failure. While maintain high rates of union.

OBJECTIVES: To evaluate the efficacy of interlocked IM nailing in the management of diaphyseal tibial fractures of closed fractures and compound fractures of grade I and grade-IIa.

MATERIALS AND METHODS: 100 tibial diaphyseal fractures were treated using the locked intramedullary nailing during May 2012 to April 2015 were included in the study. Previously tibial diaphyseal fractures were treated with;

1. Application of plaster casts.
2. Functional cast bracing.
3. Open reduction and internal fixation with dynamic compression plate and screw fixation accoprding to Muller (AO/ASIF) [3] or "v" nail.

Locked intramedullary nailing was used for 100 tibial fractures and 4 went into non-union. Of these 96 fresh tibial fractures, 24 were comminuted and 8 segmental fractures. 20 patients had associated fractures, which were also managed with appropriate management.

The median age of the patients operated was 35 years (18-60years). Of the 100 fractures 8 cases were open fractures. Out of which 6 cases were grade I and 2 cases Grade IIa open fracture and rest are closed fractures.

For the fresh tibial fractures initial radiographs were taken and limb splinted by application of above- knee posterior plaster slab. Based on fracture pattern it was classified by AO method and further management was decided upon. All the patients were tested for routine blood investigations and managed accordingly. Patients with stable fracture pattern were taken up for manipulation for plaster cast under general anaesthesia. If reduction is acceptable, it was followed up regularly with check x-ray at every 10 days. If reduction is lost or not acceptable patient is taken up for closed interlocking nailing.

Patients prepared pre-operatively by correcting anemia and associated diseases like diabetes, hypertension or bronchial asthma. The length if nail was measured preoperatively. The length of the nail is measured by subtracting 3-4cms from the distance between inter condylar area of tibia to the ankle joint of the normal limb. Two sizes above and below the measured size are kept ready. The surgery was performed under general anaesthesia or regional anaesthesia. Prophylactic intra venous antibiotics were given pre operatively and continued for 2 days.

ANALYSIS: Of the 100 locked intramedullary nailing of the tibia 86 were closed and 8 were open fractures (6 grade I and 2 grade IIa) and 6 non-unions. Of the 100 cases 56 (56%) on right side, 38 (38%) on left side, 6 cases (6%) were bilateral.

20 cases had associated with other fractures in the form of ipsilateral femur fractures (12). Colles fracture (4), clavicle fractures (2). These fractures were dealt individually by appropriate management. The median age of patients were 35 years, with a range of 18-60 years. The commonest

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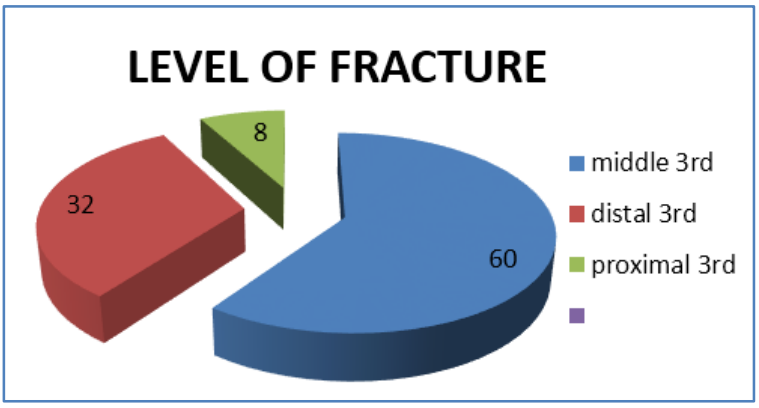
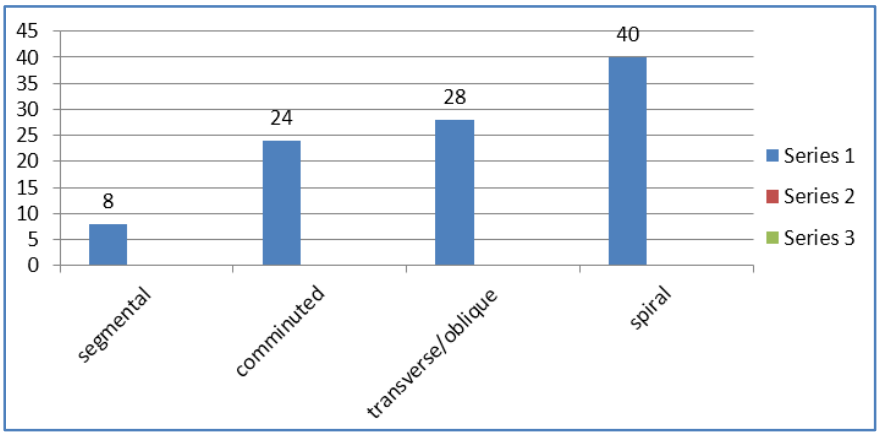
level of fracture in tibia was in middle 3rd 60 cases (60%) followed by lower 3rd 32 cases (32%), 10 cases in the proximal 3rd.



84(84%) cases were due to RTAs and 8 were due to assault, 4 are due to fall from height. The commonest type of fracture is spiral or long oblique in 40 cases (40%). Transverse or short oblique in 28 cases (28%), comminuted in 24 cases (24%) and segmental in 8 cases (8%).



All the cases were treated with reamed intramedullary nailing with static locking by putting both proximal and distal locking screws. Dynamization was done in 8 cases only and it is not routinely. The average time of dynamization was 8-20 weeks.

In 86(86%) cases closed nailing was done. Open reduction was done in 14 cases (14%0. Open reduction was done in delayed cases unsuccessful closed reduction and non-unions. We have commonly used nails if sizes 9 and 10 mm diameter and 300 to 360 mm length. The average duration of follow-up is for 18 months with the longest follow-up for 2 and half years and shortest for 3 months.

Fracture union was assessed by both clinical and radiographic appearance. A protocol for functional grading was prepared for assessing results basing on THORESSEN CRITERIA.[4]

Thus overall 91% of interlock nailing were judged to have an excellent to good results. (Excellent 76, Good 16), 4 patients were graded as fair because of pain, swelling, impaired knee range of movements. 4 cases were graded as poor because of infection, shortening, limp and impaired knee range of movement.

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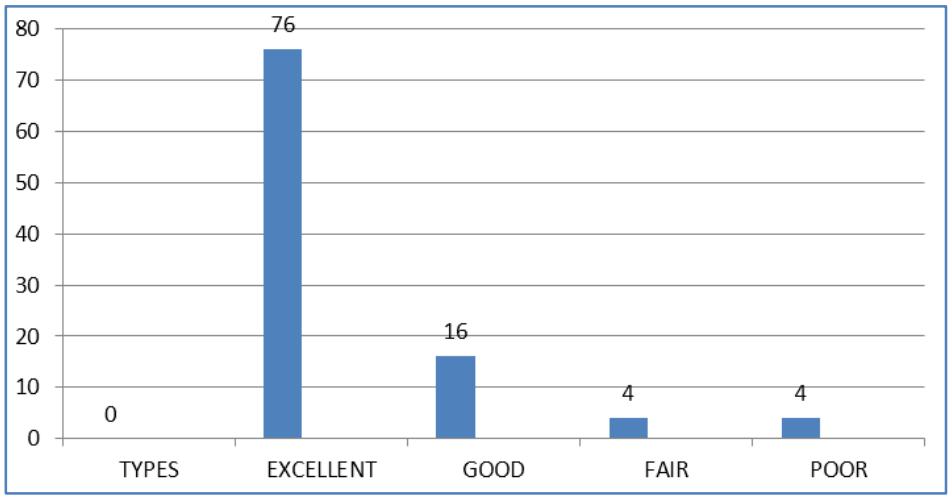

Partial weight bearing with crutches was started postoperatively after suture removal up to 6th week depending on associated fractures and fracture configuration. Full weight bearing started at an average of 12th week with a range of 8-20 weeks. The fractures treated by locked intramedullary nailing with reaming in our series united by 100%. The average time for union is 14 weeks with a range of 12-40 weeks.

In our study complications following interlocking nailing of tibia developed 4 patients (4%). Two patients with grade IIa compound fracture with unreamed nail developed infection which was controlled by IV antibiotics. 2 patients with comminuted lower one fourth tibia fracture had 5^0 of valgus deformity. 2 patients developed delayed union due to distraction at the fracture site. The fractures united eventually after dynamization. Two patients developed late distal screw loosening, removed after 3 months, fracture united well.

In our study we did not come across complications like Peroneal Nerve palsy, compartmental syndrome, breakage of implants of non-union.

Thus overall results of locked intramedullary nailing of tibia in our series were impressive and comparable with previous studies[5,6].

CONCLUSIONS:

1. The interlocking nailing has widened the range of indications for medullary osteosynthesis of tibial shaft fractures.
2. Stability is achieved by transverse threaded screws in prefabricated holes in the nails which anchor the implant directly to the cortical bone, thereby controlling length, alignment and rotation of the limb.
3. It allows early protected weight bearing and joint movement.
4. It has decreased the morbidity and dependency of the patient.
5. The rate of infection and non-union or misalignment are low.
6. Interlocking intramedullary nailing has proved to be an excellent mode of treatment for complex, comminuted, segmental and unstable tibial fractures, especially in the multiple injured patient.

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7. Since the closed intramedullary nailing does not disturb the fracture haematoma it aids in better healing.
8. Static nailing with interlocking screws both above and below the fracture site secures the best stability of the fracture.
9. Dynamic nailing with interlocking screws only through one of the ends of the nail allows the fracture site to be compressed during early weight bearing and helps in early healing of the fracture.
10. Reamed nailing has proved to give the most consistent results as reaming increases the stability and strength of the Bone-Nail unit.
11. Interlocking has a definite place in the management of grade I open fractures. (Delayed, undreamed nailing is preferred).
12. Interlocking nailing has a definitive role in the management of aseptic non-unions.

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