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DISTAL TIBIA FRACTURES TREATED WITH POSTERIOR PLATING THROUGH POSTEROLATERAL APPROACH

Orthopaedics

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ABSTRACT

Purpose of study: Distal tibia fractures are difficult to treat. Various modalities are available for the treatment. Our study aims to find out how efficient and safe is posterior plating through posterolateral approach in middle and old aged individuals and in individuals with anteromedial type 1 & 2 compound injury for distal tibial fractures.

Study designs and material: Thirteen cases of distal Tibial Fractures that came to our hospital were selected for Posterior plating through posterolateral approach . Of these 7 were closed type of fractures and 6 were open type (Gustillo Anderson type I). Other parameters such as the varus and valgus deformity, duration of wound healing, blood loss , duration healing time of the fractures and complications were taken into consideration to assess the treatment.

Observation and results: The mean surgery time was 75 minutes with a mean blood loss of 40 ml. The post-operative healing period was good in all thirteen patients. The union occurred at a mean time of 20 weeks. There was No incidence of non-union, mal union, Limb length discrepancy, varus or valgus deformity or any neuro vascular injury. Thus our study proved that posterior plating through posterolateral approach is an efficient and effective method for treating distal tibial fractures

KEYWORDS

Distal Tibial Fractures, Posterior Plating, Posterolateral approach.

INTRODUCTION:

Distal tibia fracture is often associated degrees of vascular and soft tissue injury. [1-4] Fractures with anterior soft tissue injury are difficult to treat . The difficulty is between anterior soft tissue injuries and its accurate fracture fixation[5,6]. Good Anterior soft tissue is needed for medial and lateral plates to be fixed firmly.[7,8]. External fixators are also a choice for distal tibia fractures with anterior skin loss [3,9]. But all these methods also has High prevalence of pin tract infection, malunion ,nonunion makes it difficult to manage [6-8,10]. Modified intramedullary nailing can be applied in distal tibia fractures, but its effectiveness is controversial [7,11,12]. It is difficult to choose between treatment options for distal tibial fractures with anterior soft tissue injury.

Tibial locking compression plates were used for fixation of distal tibial fractures. Our aim was providing accurate anatomical fixation and avoiding injured anterior soft tissues injury .

INCLUSION AND EXCLUSION CRITERIA:

1. Distal Tibial fracture type I and Type II gustilo Anderson classification. [13]
2. No posterior soft tissue involvement.
3. No intra articular involvement.
4. With or without Fibula fractures.
5. Patients with pathologic fractures, autoimmune diseases, blood disorders, severe multiple trauma, and surgical contraindications were excluded.

INVESTIGATIONS:

Anteroposterior (AP) and lateral radiographs of the leg, including the ankle joint, were taken in all patients. computed tomography and MRI also taken if needed.

MATERIALS AND METHODS:

13 cases of fracture of the lower tibia Fracture were recovered. Locking compression plates are used.

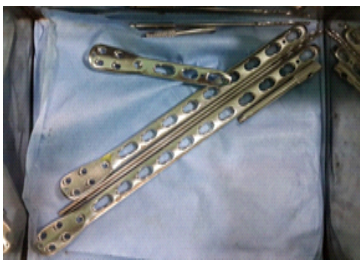


figure 1:locking compression plates

INCISION AND TECHNIQUE OF SURGERY:

Patient under epidural or general anaesthesia in prone position.

Skin incision is made along the posteromedial border of the fibula and can extend from the tip of the fibula as far proximally as is required. It should never be more medial than the lateral border of the Achilles tendon. It is important to be aware of the course of the sural nerve as it courses from the center of the calf proximally to just posterior to the fibula distally. Identify the sural nerve under the superficial fascial layer and usually include it in the lateral flap. If the dissection is extended more proximally, it may be necessary to work on either side of this nerve. Superficial dissection should be taken down to the attachment of the peroneal fascia on the posterolateral border of the fibula. Incise the fascia, and retract the peroneals medially. Access to the tibia is through a separate plane which is developed on the posteromedial border of the peroneal muscles. These are now retracted laterally. Exposure of the posterior aspect of the tibia is achieved by developing the interval between the peroneal tendons and muscles laterally and the flexor hallucis longus (FHL) medially.fracture site reached and reduction and length of tibia achieved [17,18].locking compression plates were placed posteriorly and fixed.

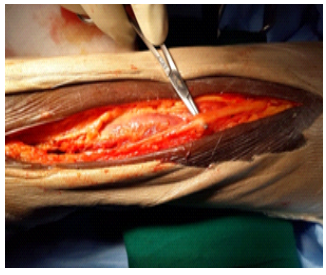


FIGURE 2:shows the line of incision and the sural nerve

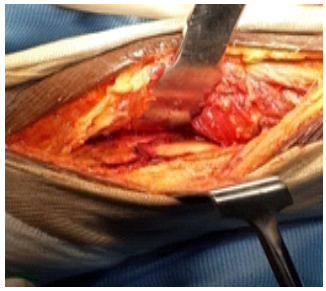


figure 3:shows the fracture site



figure 4:shows the sural nerve and the lcp used



figure 5: antroposterir and lateral view radiogragh shows distal tibia fracture

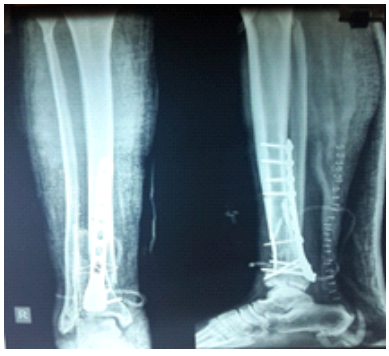


figure 6:post operative AP and lateral radiograph shows hardware insitu.

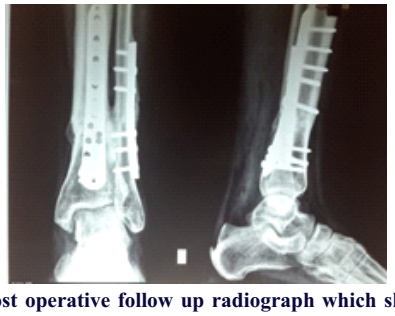


figure 7:post operative follow up radiograph which shows good callus formation.

POSTOPERATIVE MANAGEMENT:

Post operatively Antibiotic treatment was given. Peripheral circulation and skin sensation were checked. Knee and ankle joint exercises were started immediately. Based on the type of fracture, fixation strength, age, and growth of the callus the weight bearing walking time was determined. After 6 to 8 weeks partial weight bearing was allowed and after 10 to 12 weeks full weight bearing was allowed.

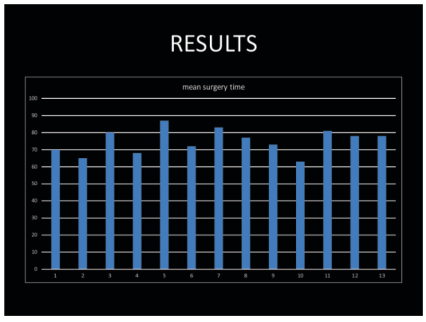
Complication rates that are looked for are:

Malunion of fracture evaluation: Johnson angle of ankle joint measured on latest AP and lateral radiographs of full-length lower leg[6,21,22]. If varus and valgus or AP angle was >5°,. malunion was confirmed Limb-shortening deformity: >1 cm shortening of the limbs.[5–8]

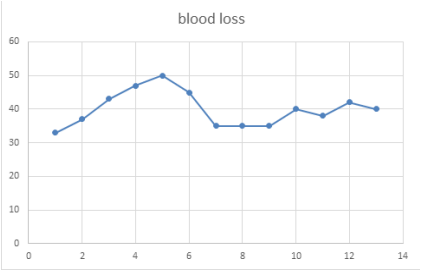
Fracture nonunion, delayed union, infection of anterior skin wound and surgical incisions infection, skin necrosis, failed internal fixation, and neurovascular injury.

OBSERVATION AND RESULTS

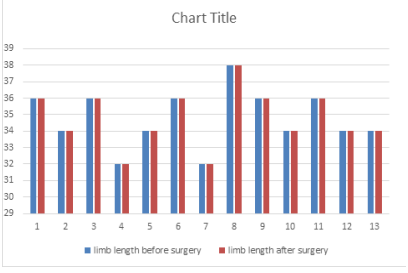
The mean surgery time was 75 minutes with a mean blood loss of 90 ml. The post-operative healing period was good in all thirteen patients. The union occurred at a mean time of 20 week. There was No incidence of non-union, mal union, Limb length discrepancy, or any neuro vascular injury. Thus our study proved that posterior plating is an efficient and effective method for treating distal tibial fractures.



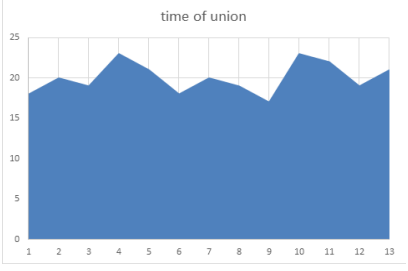
Mean surgical time is 75 min +/- 10 min.



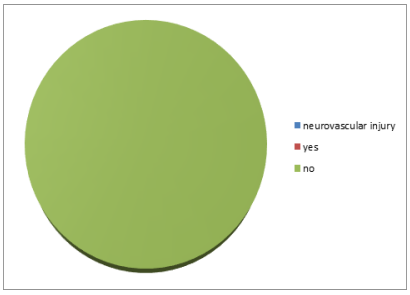
Mean blood loss 40ml +/- 10ml



Limb length discrepancy: no limb length discrepancy



Mean Time of fracture union 20 weeks +/- 5 weeks



Neurovascular injury: no neurovascular injury

DISCUSSION :

The presence of soft tissue injuries making our decision for treatment difficult. For those injures with sever soft tissue involment application of an external fixator is the preffered treatment because they can stabilise the fracture without causing further compromise.[3,9] .But this method is not without complications such as malunion or pintract infections and inconvinience [6–8,10].Thus external fixation can be used for emergency procedure. [5,6,23]

Nailing and plating can also be used for fixation of these fractures. Earlier nailing could not be used for these fractures because of their anatomy. Latest nails however have solved these problems. They are however involved with problems such as nonunion, infection, malunion and such mainly in open and communited fractures because of severe injuries. [7,11,12,24]

Now medial and lateral plate fixation are the preffered methods of treatment [7,8,10]. How ever making an anterior skin incison in cases that have soft tissue injuries have higher rates of skin infection. [5,10,21,24,26–30]

Thus the cosistency of the anterior soft tissue has been found to influence the treatment options. Krackhardt et al [6] found that fracture fixation through antero medial incision was found to take more time for healing. Although this approach does not compromise the blood flow it however damages the skin.

Sometimes these skin injuries require flap or split skin grafting procedures. Thus our study aimed at finding a better solution for this problem Thus we carried out a single stage posterolateral approach for fracture fixation using locking compression plates without involving the anterior soft tissues.

Our main concept was to avoid the anterior skin damage.The core concept of posterolateral approach fixation is to avoid the anterior damaged soft tissue to fix the fracture. Clinically, the posterolateral approach to fixation of distal tibia fractures had been previously proved by Sheerin et al [5] and has an average healing time of 20 weeks. They also found that both Tibia and Fibula can be fixed through a single incision. However this approach does have its difficulty of difficult exposure because usually achilles tendon blocks our view of the distl Tibia.

CONCLUSION:

A locking compression plate through posterolateral approach can be used for the fixation of distal Tibial fractures with associated anterior soft tissue compromise and it did not result in serious complication like malunion, non-union, limb length discripency, sural nerve injury. This method also protects the blood supply of distal tibia.

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