

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## The Outcome of Illizarov Ex-Fix in Treatment of Distal 1/3 Tibial Fractures.

**Anwar Sathik S\*, Sivakumar, Harish R, and K Venkadachalam.**

Department of Orthopaedics, Sree Balaji Medical College & Hospital, Bharath University, Chrompet, Chennai 600044, Tamil Nadu, India.

### ABSTRACT

Distal tibial fractures are surgical challenging in view to achieve near normal anatomical restoration of ankle joint congruity and associated instabilities caused by ligamentous and soft tissue injury which are often associated with them. The use of illizarov apparatus has been found to reduce the complications. Only 2 cases which failed to show clinico-radiological features of union ,were prophylactically bone grafted and immobilisation continued untill union was achieved by 12th monthThe technique of using external ring fixation avoids soft tissue detachment to an already jeopardised vascular status. There by ensuring a decreased infection rate and enhancing the chances of natural .

**Keywords:** External ring fixator is the best for treating distal tibial fracture(Pilon fracture).

*\*Corresponding author*

**INTRODUCTION**

Distal tibial fractures are a surgical challenge in view of achieving near normal anatomical restoration of the ankle joint congruity and the associated instabilities caused by ligamentous and soft tissue injury which are often associated with them. The management principle laid down by Rüedi and Allgöwer were followed earlier had high rate of complications. The present concept is a two step procedure wherein temporary external fixation is applied first, followed later by open reduction and internal fixation after the soft tissue injury had resolved. Number of studies showed that staged procedures radically have changed the rate of complications and have proved to be prognostically positive. Because of the proximity to the joint and the minimal soft tissue coverage even extra articular injuries have many complications as compared to a mid-shaft tibia fracture.

Many a studies have reiterated the role of the soft tissue injuries in defining outcomes. In case of an intra-articular fracture the use of an external fixator first and then converting to a stable internal fixation later has many advantages. The use of Ilizarov apparatus has been found to reduce the complications.

The advantage of this procedure is the ability to do a second stage procedure within a 16-25 weeks period.

**Aim**

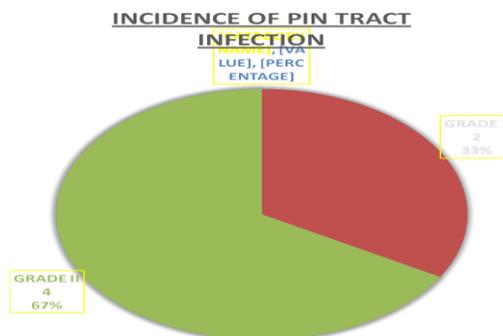
To highlight the positive outcome of Ilizarov fixator's utility in distal tibia fractures of both intra and extra articular variety.

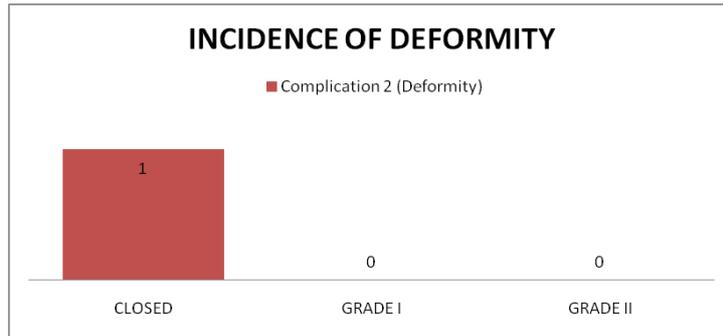
**METHOD**

**Inclusion Criteria**

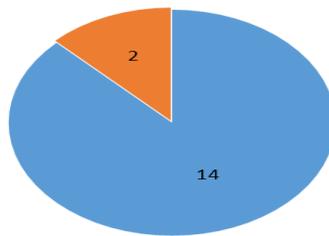
- Patients aged between 18–75 years,
- ] Fracture geometry of displaced distal meta-physeal type.
- Distal 1/3<sup>rd</sup> tibia fractures with an angulation of more than 10 degrees in any plane
- Intra-articular fractures .

Patients who are participating in this study gave written and informed consent. All the fractures were classified according to the specific type that they belonged to, like the AO classification, Reudi Allgöwer, Gustilo or Tscherny for bimalleolar, plafond, open and closed fracture types respectively. Surgeries were carried out on a radiolucent table without tourniquet. C-Arm guidance was used for the pin placement and joint reduction assessment. The fractures were reduced with traction, manipulation and external pressure. In difficult cases percutaneous Steinmann pin and elevators were used as joysticks to achieve near normal anatomical reduction. Proximal ring was positioned at the level of the Head of Fibula. Additional stability when needed, was achieved using multiple parallel K-wires. The juxta articular fragments were reined in by using Olive wires. All wires were tensioned to 120 kg minimum. Additional stability when deemed necessary, was achieved by adding multiple rings to the Tibia. The rings were connected by multiple parallel rods. All surgeries were carried out by two experienced surgeons in our department.





### TIME TAKEN FOR FRACTURE CONSOLIDATION POST FIXATOR REMOVAL.



■ Union ■ Non Union



## DISCUSSION

Irrespective of the fracture pattern and the mechanism of injury(axial compression/tortional forces), outcomes were positive union ,without a second stage hardware procedure. Only 2 cases which failed to show clinico-radiological features of union ,were prophylactically bone grafted and immobilisation continued until union was achieved by 12th month .Radiological fracture geometry did not influence the treatment algorithm. Any additional complications ,such as soft tissue trauma or the fracture extension into the diaphysis, also did not affect our treatment algorithm.

While 3 out of our 16 patients had an extra articular type of fracture which could have been treated with the newer types of locking intra medullary nails. It was decided against the former, in view of the risk of their biomechanical instability. While the latest techniques of stable fixation with plate and screws was contemplated ,but the disadvantage of the associated wound infections ,both superficial and deep ,made us opt in favour of the external fixator ring device.

An inevitable complication of this device is Pin tract infection. In various studies they have ranged from 4.1% to 71%. Other studies have also found that the incidence of infection in ring fixators was less than that in unilateral hybrid fixators. In our study, there were 6 instances(37.5%) of simple pin tract infections, which were treated with culture appropriate oral antibiotics for 6 weeks and dressings, with 3 instances requiring exchange of the pin. The accepted deformity is still a controversial subject .The Radiological parameters are never a good clinical guide.

Etter and Ganz, in a 10 year follow up found out that though perfect anatomical reduction was achieved radiologically in the initial treatment,it did not correlate well with the clinical outcomes with regard to range of movement and later development of post traumatic arthritis. Williams et al. had done a study to evaluate the effect of fracture type and patient variables in determining the outcome of the study .The follow up period was for two years they were assessed upon four independent measures and found no correlation between any of them. They also found out that the patients ability to return to his work depended upon the educational level of the patient. Pollak et al. did a study on 80 patients with pilon fractures and found that the injury severely hampered the health and financial status of the patient.

In our study, in contradiction to the above study, the quality of life for those patients with metaphyseal fractures were same as that of those with intra articular fractures.They however had some limitations in participating in sporting activities such as jogging and running etc.

Marsh et al. had found that though the intra articular fractures had a negative impact on the daily activities of the patients, only a few patients required a secondary reconstructive procedure at the end of five years because most of them eventually healed to a normal status by that time [1-8].

## CONCLUSION

The technique of using external ring fixation avoids soft tissue detachment to an already jeopardised vascular status. There by ensuring a decreased infection rate and enhancing the chances of natural union. Fibular fixation is uncalled for and does not significantly affect ankle stability.

It further promotes early mobilisation of the ankle.

- undisputedly ring fixator option is there to stay in the management of distal tibial fractures.

## REFERENCES

- [1] Bone L (1987) Fractures of the tibial plafond: the pilon fracture. Orthop Clin North Am 18:95–104
- [2] Bourne RB (1989) Pilon fractures of the distal tibia. Clin Orthop 240:42–46
- [3] Brumback RJ, McGarvey WC (1995) Fractures of the tibial plafond: the pilon fracture: evolving treatment concepts. Orthop Clin North Am 26:273–285
- [4] Conroy J, Agarwal M, Giannoudis PV, Matthews SJE (2003) Early internal fixation and soft tissue cover of severe open tibial pilon fractures. Int Orthop 27(6):343–347



- [5] Crutchfield EH, Seligson D, Henry S et al (1995) Tibial pilon fractures: a comparative clinical study of management techniques and results. *Orthopaedics* 18:613–617
- [6] Mast J, Spiegel PG, Pappas J (1988) Fractures of the tibial pilon. *Clin Orthop* 230:68–82
- [7] McFerron MA, Smith SW, Baulas J (1992) Complications encountered in the treatment of tibial pilon fractures. *J Orthop Trauma* 6:195–200
- [8] Ruedi TP, Allgower M (1979) The operative treatment of intra-articular fractures of the lower end of the tibia. *Clin Orthop* 138:105–110