



## A STUDY OF COMPARISON OF FUNCTIONAL OUTCOME OF MEDIAL VERSUS ANTEROLATERAL PLATING OF DISTAL TIBIA FRACTURES

Karthik G\*, Senthilnathan A, Balamurugavel P.S., Prabhakar R, Viswanathan M

Department of Orthopaedics, Rajah Muthiah Medical College Hospital Annamalai University, Chidambaram

### ARTICLE INFO

#### Article History:

Received 9<sup>th</sup>, September, 2015

Received in revised form 24<sup>th</sup>, September, 2015

Accepted 12<sup>th</sup>, October, 2015

Published online 28<sup>th</sup>, October, 2015

#### Key words:

Distal tibia fractures, medial locking compression plates, anterolateral locking compression plates, Karlstrom Olerud score

### ABSTRACT

**Background:** The treatment of distal tibia fractures is complex involving multiple factors which include the associated soft tissue injury, involvement of the articular surface, the selection of optimal implants, timing of the surgery, associated medical co-morbidities like diabetes and a watchful immediate post operative management.

**Methods:** 24 patients with distal tibia fractures were included in our study at Rajah Muthiah medical college & Hospital, Chidambaram of which 12 were operated with distal tibial medial locking compression plates and the remaining with distal tibial anterolateral locking compression plates.

**Results:** All distal tibia fractures were extra articular based on the inclusion criteria. Two patients had infection immediate post op which settled with antibiotic coverage and wound dressing. Three patients had delayed wound healing due to superficial skin necrosis. Two patients had malunion with implant in situ. The mean value of the Karlstrom-Olerud score in the medial plating group was 30.08 whereas in the anterolateral plating group was 29.08. The mean period of union of fracture post surgery was 9.8 weeks.

**Conclusion:** No significant statistical differences were found between the 2 approaches and plates regarding the clinical and radiographic results. The onset of complications appeared to depend more on the injury itself than on the type of approach employed to manage the fractures.

Copyright © Karthik G *et al.* 2015, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

### INTRODUCTION

Distal tibia fractures make up 1% to 10% of all lower extremity fractures. The restoration of the osseous anatomy while ignoring the often traumatised soft tissue envelope frequently led to poor post operative outcomes and high complication rates. Although the optimal time to surgery remains controversial, surgery is often delayed for at least 10 days to allow wrinkles to return, blisters to re-epithelialise and wounds to heal. In view of these considerations, the present study is to analyse and compare the functional outcome of medial versus anterolateral plating of distal tibia fractures. The major factors considered were post operative infection, surgical wound healing, fracture union, incidence of malunion and ankle movements.

### MATERIALS AND METHODS

This study was conducted in Rajah Muthiah Medical College And Hospital, Annamalai University from June 2014 to September 2015. During this period 24 cases of adult patients with distal tibia fractures were selected according to inclusion criteria. Patients with distal tibia fractures admitted for the study were recorded in a proforma prepared for the study. The patients were followed till fracture union and functional recovery. The distal neurovascular status of the affected lower limb was examined and plain radiograph of leg with ankle in anteroposterior and lateral views were taken to assess the site and type of fracture. The fractures were classified according to Ruedi and Allgower's classification. Patients were operated with either medial or anterolateral plating with the corresponding approach under intra operative C-arm and tourniquet control. Fibula fracture was fixed when around the syndesmosis or more distally. All adult

\*Corresponding author: Karthik G

Department of Orthopaedics, Rajah Muthiah Medical College Hospital Annamalai University, Chidambaram

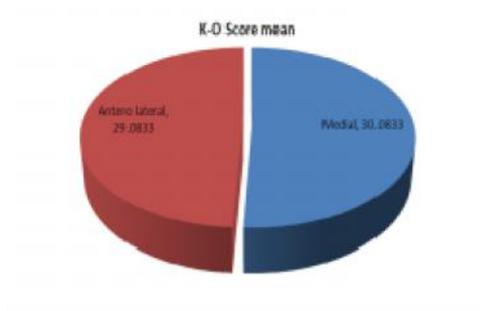
patients of either sex with closed distal tibia fractures, extra articular with or without associated fracture of fibula were included in the study. The patients with intra articular extension (pilon fracture), paediatric fractures, compound fractures and those associated with neurovascular injury were excluded.

**RESULTS**

All distal tibia fractures were extra articular based on the inclusion criteria. Two patients had infection immediate post op which settled with antibiotic coverage and wound dressing. Three patients had delayed wound healing due to superficial skin necrosis. Two patients had malunion with implant in situ. The mean value of the Karlstrom-Olerud score in the medial plating group was 30.08 whereas in the anterolateral plating group was 29.08. The mean period of union of fracture post surgery was 9.8 weeks.

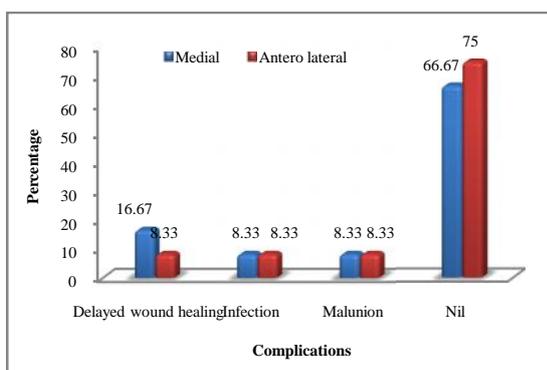
**Table 1** Group Statistics K-O Score

Plate Type	No.	Mean	Std. Deviation	p value
Medial	12	30.08	2.53909	0.373
Antero lateral	12	29.08	2.84312	



**Table 2** Complications

Complications	Plate Type				Total	
	Medial No.	Medial %	Antero lateral No.	Antero lateral %	Total No.	Total %
Delayed wound healing	2	16.67	1	8.33	3	12.50
Infection	1	8.33	1	8.33	2	8.33
Malunion	1	8.33	1	8.33	2	8.3
Nil	8	66.7	9	75.0	17	70.8
<b>Total</b>	<b>12</b>	<b>100.0</b>	<b>12</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>



PRE OP      3 WEEKS POST OP      9 WEEKS POST OP

**Fig.1** Case Illustration

**DISCUSSION**

In our study, in both medial and anterolateral plating group right side was affected in 41.7% and left side was affected in 58.3%. In the medial and anterolateral plating group percentage of A1 type, A2 type and A3 type were 25%, 50% and 25% respectively. In both the groups A2 type fracture is the most common. The medial plating group had a mean consolidation time of 9.83 weeks compared to the anterolateral plating group where the mean was 10.33 weeks. The mean score of the medial plating group was 30.08 and that of the anterolateral group was 29.08 inferred as good and satisfactory respectively. The interpretation was that there is no significance between the medial and anterolateral group with regards to the final functional outcome. Of the 12 patients in the medial plating group 33.3% had complications and of the 12 patients in the anterolateral group 25% had complications.

**CONCLUSION**

To conclude open reduction and internal fixation of distal tibial fractures provide reliable results. No significant statistical differences were found between the 2 approaches regarding the clinical and radiographic outcomes. The onset of complications appeared to depend more on the injury itself that on the type of approach employed to manage the fractures. The soft tissue involvement with its site and depth, fracture configuration and intra articular involvement are the most important parameters in deciding the appropriate approach and implant

**References**

1. Ruedi T , Matter P , Allgower M (Intra articular fractures of the distal tibia end) *Helv Chir Acta* 1968;35(5):556-582
2. Mast JW, Spiegel PG,Pappas JN. Fractures of the tibial pilon .*Clin Orthop Relat Res* 1988(230):68-82
3. Telmo de Oliveira Ramos, On the treatment of tibial fractures using Ilizarov fixator,2014; University of Gothenberg
4. Yih-Shiunn Lee, MD; Shih-Hao Chen, MD; Jen-Ching Lin, MD; Yun-O Chen, MD; Chien-Rae Huang, MD; Chyi-Yin Cheng, MD. *Healio Orthop.*2006;Vol 32:Issue 3
5. C.A. Encinas-Ullán, R. Fernandez-Fernandez, J.C. Rubio-Suárez, E. Gil-Garay. Medial versus lateral

- plating in distal tibia fractures: A prospective study of 40 fractures. *Rev Esp Cir Ortop Traumatol.* 2013;57(2):117-122
6. Oong Jin Shon, Chul Hyun Park. Minimally invasive plate osteosynthesis of distal tibia fractures: A comparison of medial and lateral plating. *J Orthop Sci* 2012(17):562-566
7. AO manual of fracture management, internal fixators, concept and cases using LCP and LISS Stuttgart, New York: Thieme (2006).
8. Etter C, Ganz R. Long-term results of tibial plafond fractures treated with open reduction and internal fixation. *Arch Orthop Trauma Surg.* 1991;110-6:277-283
9. Sirkin M, Sanders R, DiPasquale T, et al. A staged protocol for soft tissue management in the treatment of complex pilon fractures. *J Orthop Trauma* 1999;13(2):78-84

\*\*\*\*\*