Original Research Article

Management and complications of Distal Tibial fractures

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Abstract

Background: Management of distal tibal fractures is a great challenge. This type of fractures has high complication rate.
Materials and methods: 86 fractures on 86 patients were studied during the period of 2015 to 2017 April. Intramedullary nailing, internal fixation, external fixation and conservative treatment were used. Treatment outcome was measured by occurrence of complications, radiographic analysis, evaluation of the American orthopaedic foot and ankle society (AOFAS) ankle score and measures of the ankle range of motion.
Results: The average functional score was 79 points and complications occurred in 16 patients.
Conclusion: Poor results were due to complications, fracture severity and use of external fixation. So we recommended external fixation must reserve for trauma with severe kin injury and other cases can be treated by traditional open reduction and internal fixation with early mobilisation.

Key words

Management, Complications, Distal tibial fracture.

Introduction

Management of distal tibial fracture is a great challenge. It is more difficult for reduction and maintenance of these fractures. Reduction is more difficult due to fibular fracture at the same level as the tibial fracture [1, 2, 3, 4]. Several treatment methods are available for these fractures such as; intramedullary nailing, traditional open reduction and internal fixation, external fixation and minimally invasive bridge plate. All these techniques have their own merits and demerits in the management of these fractures [5, 6, 7, 8].

Outcome of surgical procedures for these fractures are not always excellent and 20-50% patients are affected due to complications [9, 10].

Thus the aim of this present study was to evaluate the functional and radiographic results of distal tibial fractures and to determine predictive factors of poor results.

Materials and methods

This retrospective study was carried out in Konaseema institute of medical sciences and research foundation during the period of 2015 to April 2017. 86 fractures on 86 patients were studied during this period. Distal tibial fractures were classified according to the AO/OTA classification [3] open fractures were classified based on the gustilo classification for open fractures.

Depend on the type of fractures operative procedures were determined by the surgeon. Open fractures without skin damage was treated within 24 hours and other fractures were treated after the recovery of soft tissue. After the surgical procedure, follow-up and clinical examination was performed in the hospital. All the patients were provided informed consent prior to their inclusion in the study. American orthopaedic foot and ankle society (AOFAS) ankle score [11] and range of motion (ROM) was determined. Scoring system classified into three major categories: pain, function and alignment. In this scale, 50 points to function, 40 points to pain and 10 points to alignment. Score between 90 and 100 are excellent, 75-89 is good, 50-74 fair and < 50 poor [12] statistical analysis was performed with the SPSS 20.0 software. AP value of 0.05 or less was considered significant.

Results

Among 86 patients 29 were females and 57 were male patients. Out of 86 patients, 81 patients were reviewed for clinical and radiological evaluation and 5 patients were absent for follow-up. Among 86 cases, 58 cases due to the road traffic accidents (60.34%) and falls from height (39.65%), twisting injury occurs in 28 cases. The fallow-up time was ranging from 12-46 months. External fixation was performed mostly in cases of multiple trauma (**Table - 1**).

Surgical complication occurred in 5 patients. The complication rate was significantly different according to the osteosynthesis type (**Table - 2**).

9 patients (11.11%) presented with intra-articular step-off and malunion occurred in 6 patients (7.4%). Malunion rate and intra-articular step off rate was higher in the external fixation group.

AOFAS- ankle score was 76 points. Results were excellent in 29 cases, good in 27, fair inn 25 and poor in 5 cases. The average pain score was 30 points, function score was 35 points and the alignment score was 7 points, average range of motion 14^0 of ankle dorsiflexion and 32^0 of ankle plantar flexion.

Discussion

Management of distal tibial fracture is difficult and has high complication rate. Postoperative complications occurred in 19.75% of patients

with infections and non-unions. Our complication rate is comparable with other studies ranging from 20% to 50% [3, 9, 10, 13, 14]. In this study, the best clinical outcomes were found in internal fixation group with a complication rate of 8.69%. Our findings were similar to the other studies [3, 10, 13, 14, 15]. In the case of external fixation group, complication rate was comparatively high 51.85%. Similar findings were recorded by other authors, they found out external fixation provided more malunion pain or stiffness [3, 6, 8, 16].

Table - 1: Type of fracture with demographic data based on Osteosynthesis method.

Demographic data	Internal fixation (n= 23)	External fixation (n= 27)	Plate (n= 32)	Intramedullary Nailing (n= 4)	P value
Male	14	20	20	3	0.75
Female	9	7	12	1	0.75
Polytrauma	2	12	2	1	<0.02
Open fracture	2	12	2	0	<0.02
AO/OTA Classification					
Type A	4 (17.39%)	3 (11.11%)	5 (15.6%)	3 (75%)	0.72
Type B	14 (60.86%)	15 (55.55%)	17 (53.1%)	1 (25%)	0.72
Type C	5 (21.74%)	9 (33.33%)	10 (31.25%)	0	0.72

Table - 2: Comparison between osteosynthesis method and functional outcomes.

Scoring category	Internal fixation (n= 23)	External fixation (n= 27)	Plate (n= 32)	P value
AOFAS scoring	86.7 points	67.3 points	79.2 points	<0.001
Pain	32.3 points	30.2 points	28.3 points	<0.02
Function	42.2 points	32.4 points	37.3 points	<0.002
Alignment	9.5 points	8.1 points	8.4 points	0.13
Total range of motion	48.2°	25.3°	37.5°	<0.001
Complication rate	8.69%	51.85%	31.25%	<0.005

For acute fracture without skin injury, we preferred to use limited internal fixation with less postoperative complications. Non-weight bearing cast in recommended with this type of operative technique. Distal tibial fractures with skin injury or multiple injuries, we recommended two staged protocol. In first stage, approximate reduction of fracture and application of external fixation. During second stage after soft tissue recovery, performed open reduction and internal fixation to manage the distal tibial fracture. Clinical outcome from this technique was similar to the other researchers [2, 5, 17].

Conclusion

Distal tibial fractures are therapeutic challenge from the surgeons. In this retrospective study, we did not observe differences between the each technique and also there was sample selection bias. So there is need to study each operative technique carefully to know in which method giving better clinical outcome with minimal or no complications. Another limitation of our study in short term fallow up, which did not tell us about the long term complications as osteoarthritis. Although there is such limitations, but based on our study, in external fixation group has more complications rte with bad clinical outcomes. We recommended external fixation technique can be preserved only for the fracture with tissue injury or polytrauma. For other

fractures cases open reduction and internal fixation with early mobilisation are highly recommended.

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