

POST-OPERATIVE OUTCOME OF OPERATED TIBIAL FRACTURE?

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ABSTRACT

Background: Tibial fractures are among the most common type of fractures which were encountered in the emergency departments to the orthopedic surgeons. The most common etiology of tibial fractures are road traffic accidents, fall from height, assault, and bone infections. There are various operative procedures for tibial fractures which are open reduction and plate osteosynthesis, minimally invasive plate osteosynthesis, external fixators, ring fixators and interlock nailing. **Material & Methods:** The present prospective study was conducted at department of orthopedics of Preksha Hospital & Chetna Ivf Research Centre and Manidhari Hospital & Maloo Neuro Centre, Jodhpur. 200 Patients with unilateral, distal tibial shaft fractures were enrolled from emergency and outdoor departments by simple random sampling. **Results:** 118 (59%) patients had left limb tibial fractures. The most common mode of fracture in present study was road traffic accidents among 136 (68%) patients which is followed by fall from height among 54 (27%) patients. Out of total patients, full weight bearing time was early (<3 weeks) among 128 (64%) patients out of them 60 (46.9%) were managed by plating and 68 (53.1%) were managed by nailing. Out of total patients, full weight bearing time was late (>3 weeks) among 72 (36%) patients out of them 03 (4.2%) were managed by plating and 69 (95.8%) were managed by nailing. **Conclusion:** Operative management of tibial fractures by closed interlocking nailing provides adequate stabilization and reported to seen with early weight bearing in majority of patients. Along with that better anatomical reduction and less incidence of post-traumatic osteoarthritis.

KEY WORDS: Tibial fractures, Mobilization, VAS scoring.

INTRODUCTION

The incidence of lower leg fractures has been reported up to 200 fractures per lac persons per year. The operative management and post-operative care are challenging task, primarily because of its osseous nature therefore the wound healing can be critical. The main blood supply of the tibia is runs axially in lower leg which leads to a disbalance of the intramedullary blood supply to the distal tibia (1). In the cases where surrounding soft tissue and covering muscles are missing, the osseous healing capacity is reduced.

Therefore, for better outcome early treatment and adequate management is a key factor so the patient could resume his day to day routine activity (2). Along with loss of days due to disability due to fracture, a longer hospital stays results in increase in out of pocket expenditure which means economic loss to patients which results in worsening the economic condition of their family (3). There is complex musculoskeletal injury occur in the cases of fracture which characteristically involves bone and

surrounding soft-tissues. Local circulatory changes occur due local inflammation in the recovery phase following fracture and characterized by pain of varying nature and reflex immobilization(4).

Tibial fractures are among the most common type of fractures which were encountered in the emergency departments to the orthopaedic surgeons. However, they are most common fractures, there are various management options are available for better post-operative outcome. The most common etiology of tibial fractures are road traffic accidents, fall from height, assault, and bone infections (5). There are various operative procedures for tibial fractures which are open reduction and plate osteo synthesis, minimally invasive plate osteo-synthesis, external fixators, ring fixators and interlock nailing. All of these operative procedures are depending up on patients age, type and degree of fractures, soft tissue injury status, bone density of patient or any other associated complications. Most common post-operative complications are vascular injury and compartment syndrome (6).

However, the operative method of choice for tibial fractures still debatable and remains a topic of research. The operative goals for tibial fractures management are stable fixation with anatomical alignment with minimal soft tissue injury along with better joint motion and rapid healing with early weight bearing. Therefore, the present study aimed to find out the postoperative outcome of tibial fractures management with nailing and plating compression in the terms of VAS score and mobilization efficacy.

MATERIALS & METHODS

The present prospective study was conducted at department of orthopaedics of Preksha Hospital & Chetna Ivf Research Centre and Manidhari Hospital & Maloo Neuro Centre, Jodhpur. The study duration was of one year from June 2017 to July 2018. A sample size of 200 was calculated at 90% confidence interval at 10% of maximum allowable error. Patients with unilateral, distal tibial shaft fractures were enrolled from emergency and outdoor departments by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study.

All the study participants were subjected to routine blood investigations and pre anaesthetic check-up. Patients who had pathological fractures and intra articular fractures were excluded from the study. Operative procedure selection was done by the type of fracture as per AO classification. Patients were assessed post-operatively for active toe movements and data of ankle ROM exercises and quadriceps exercises were recorded. Pain was assessed post-operatively by VAS Score on 1st day, 5th day, 14th day, 6th week, 3rd month and 6th month. All patients were advised for physiotherapy and walking from non-weight bearing to partial and full weight bearing walking as postoperative duration is increases. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In present study, we enrolled 200 patients with unilateral tibial fractures. Out of these two hundred patients 152 (76%) were males and 48 (24%) were females. Males were encountered with higher number for tibial fractures in our study. Majority of patients i.e. 88 (44%) were in 18-30 age group out of them 62 (31%) were males and 26 (13%) were females. Next common affected age group was 31-40 years which had 50 (25%) patients which is followed by 41-50 years age group which had 32 (16%) patients. While 18 (9%) and 12 (6%) patients were in 51-60- and 61-70-years age group respectively. The mean age of study participants was 46.3±8.7 years. (Table 1)

Table 1: Distribution of study participants according to age and gender

Age (years)	Male	Female	Total (%)
18-30	62(31%)	26 (13%)	88 (44%)
31-40	36(18%)	14(7%)	50 (25%)
41-50	28(14%)	4(2%)	32(16%)
51-60	16(8%)	2 (1%)	18 (9%)
61-70	10(5%)	2(1%)	12 (6%)
Total	152 (76%)	48 (24%)	200 (100%)

In present study, out of total two hundred patients of unilateral tibial fractures, 118 (59%) had left limb tibial fractures. The most common mode of fracture in present study was road traffic accidents among 136 (68%) patients which is followed by fall from height among 54 (27%) patients. Out of total patients, full weight bearing time was early (<3 weeks) among 128 (64%) patients out of them 60 (46.9%) were managed by plating and 68 (53.1%) were managed by nailing. Out of total patients, full weight bearing time was late (>3 weeks) among 72 (36%) patients out of them 03 (4.2%) were managed by plating and 69 (95.8%) were managed by nailing. All the cases of early and delay mobilization were managed after the operative procedure accordingly. (Table 2)

Table 2: Distribution according to full weight bearing (in weeks) according to procedure.

Mobilization (Full weight bearing)	Procedure		Total
	Plating	Nailing	
Early (<3 weeks)	60 (46.9%)	68 (53.1%)	128 (64%)
Delay (>3 weeks)	03 (4.2%)	69 (95.8%)	72 (36%)

Table3: Association of Follow-up VAS scoring with full weight bearing (in weeks).

VAS score		Mobilization (Full weight bearing)		P value
		Early (<3 weeks)	Delay (>3 weeks)	
1 month	7.4±0.69	8.0±0.42	<0.05	
	5.6±0.43	6.0±0.21	>0.05	
	2.4±0.32	3.1±0.40	<0.05	

In present study, out of total two hundred patients of unilateral tibial fractures, VAS score for 1st month follow up period among patients with early (<3 weeks) mobilization was 7.4±0.69 and among patient with delay mobilization (>3 weeks) was 8.0±0.42. This difference was statistically significant (P value <0.05). VAS score for 3rd month follow up period among

patients with early (<3 weeks) mobilization was 5.6±0.43 and among patient with delay mobilization (>3 weeks) was 6.0±0.21. This difference was statistically non-significant (P value >0.05).VAS score for 6th month follow up period among patients with early (<3 weeks) mobilization was 2.4±0.32 and among patient with delay mobilization (>3 weeks) was 3.1±0.40. This difference was statistically significant (P value <0.05). (Table 3)

DISCUSSION

Tibia fractures presented with wide spectrum of musculoskeletal injuries which leads to permanent disabilities. Along with loss of days due to disability due to fracture, a longer hospital stays results in increase in out of pocket expenditure which means economic loss to patients which results in worsening the economic condition of their family (3). There is complex musculoskeletal injury occurs in the cases of fracture which characteristically involves bone and surrounding soft-tissues. Local circulatory changes occur due local inflammation in the recovery phase following fracture and characterized by pain of varying nature and reflex immobilization. In present study, we enrolled 200 patients with unilateral tibial fractures. Out of these two hundred patients 152 (76%) were males and 48 (24%) were females. Males were encountered with higher number for tibial fractures in our study. Majority of patients i.e. 88 (44%) were in 18-30 age group out of them 62 (31%) were males and 26 (13%) were females. Next common affected age group was 31-40 years which had 50 (25%) patients which is followed by 41-50 years age group which had 32 (16%) patients. While 18 (9%) and 12 (6%) patients were in 51-60- and 61-70-years age group respectively. The mean age of study participants was 46.3±8.7 years.

Similar results were reported in a study conducted by Dendrinis et al among 24 patients of unilateral tibial fractures they found that out of total 18 were males and 6 were females with a mean age of 39±5.4 years. They found the most common cause of tibial fractures was road traffic accidents which was followed by fracture due to falls from a height (7). Similar results were reported in a study conducted by Barei et al among 41 patients of unilateral tibial fractures they found that out of total 23 were males and 18 were females with a mean

age of 41 ± 2.3 years. They found the most common cause of tibial fractures was road traffic accidents and trauma. They also reported that satisfactory articular reduction found among 17 patients and satisfactory coronal plane alignment found in 28 patients along with satisfactory sagittal plane alignment observed among 21 patients and satisfactory tibial plateau width observed among 31 patients (8). Similar results were reported in a study conducted by Patil et al among 30 patients of unilateral tibial fractures they found that patients were managed by Lateral plating among majority of cases and only 6 were managed by dual plating (9).

In present study, out of total two hundred patients of unilateral tibial fractures, 118 (59%) had left limb tibial fractures. The most common mode of fracture in present study was road traffic accidents among 136 (68%) patients which is followed by fall from height among 54 (27%) patients. Out of total patients, full weight bearing time was early (<3 weeks) among 128 (64%) patients out of them 60 (46.9%) were managed by plating and 68 (53.1%) were managed by nailing. Out of total patients, full weight bearing time was late (>3 weeks) among 72 (36%) patients out of them 03 (4.2%) were managed by plating and 69 (95.8%) were managed by nailing. All the cases of early and delay mobilization were managed after the operative procedure accordingly. Similar results were reported in a study conducted by Ahmed et al among 25 patients of unilateral tibial fractures they found that the mean age of patients was 38.3 ± 4.7 years and majority of them were managed by distal tibial locking plate (10).

In present study, out of total two hundred patients of unilateral tibial fractures, VAS score for 1st month follow up period among patients with early (<3 weeks) mobilization was 7.4 ± 0.69 and among patient with delay mobilization (>3 weeks) was 8.0 ± 0.42 . This difference was statistically significant (P value <0.05). VAS score for 3rd month follow up period among patients with early (<3 weeks) mobilization was 5.6 ± 0.43 and among patient with delay mobilization (>3 weeks) was 6.0 ± 0.21 . This difference was statistically non-significant (P value >0.05). VAS score for 6th month follow up period among patients with early (<3 weeks) mobilization was 2.4 ± 0.32 and among

patient with delay mobilization (>3 weeks) was 3.1 ± 0.40 . This difference was statistically significant (P value <0.05). Similar results were reported in a study conducted by Lee et al among 35 patients of unilateral tibial fractures they reported that all patients were operated by less invasive stabilization system with good post-operative outcome and no case of non-union and loss of reduction (11). Similar results were reported in a study conducted by Feng et al among 32 patients of unilateral tibial fractures they reported that non-significant difference in outcome of dynamic compression plate method and locking compression plate method (P>0.05) (12).

CONCLUSION

We concluded from the present study that operative management of tibial fractures by closed interlocking nailing provides adequate stabilization and reported to seen with early weight bearing in majority of patients. Along with that better anatomical reduction and less incidence of post-traumatic osteoarthritis was reported. Therefore, operative management of tibial fractures give rigid fixation to restore articular congruity and provide early mobilization and results in providing optimal knee function.

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