

## POST-OPERATIVE OUTCOME EVALUATION OF MOBILIZATION AMONG OPERATED CASES OF TIBIAL FRACTURE

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### ABSTRACT

**Background:** Mechanization of the modern world has increased incidence of road traffic accident. It is the price we pay for our scientific progress. With the increasing incidence of road traffic accidents, there is also a rise in polytrauma with complicated musculoskeletal injuries and tibia fractures are among the most common conditions treated by orthopedic surgeons in their daily practice. **Material & Methods:** The present cross-sectional prospective study was conducted at department of orthopaedics of our tertiary care hospital. 100 Patients who had unilateral, complete distal third tibia shaft fractures who were operated with either intramedullary nailing or plating were enrolled for the study. **Results:** In present study in 57% cases left limb was affected. In majority of cases 66% mode of injury was RTA. This was followed by fall from height 31%. In the present series full weight bearing time was early (<3 weeks) with 60% and 40% patients within delay (>3 weeks) of surgery. VAS score was significant (<0.05) better in first month (7.6±0.84) and (2.3±0.5) six month in early (<3 weeks) mobilization. In delay mobilization (>3 weeks) VAS score was statistically significant (<0.05) better in first month (8.1±0.3) and (3.4±0.4) six month. **Conclusion:** interlocking nailing appears to be promising method of treatment of unstable tibia fractures in adults without any external splintage after adequate stabilization and early weight bearing leading to excellent functional results in most of cases.

**Key words:** Tibial fractures, VAS scoring, Mobilization.

### INTRODUCTION:

Mechanization of the modern world has increased incidence of road traffic accident. It is the price we pay for our scientific progress. With the increasing incidence of road traffic accidents, there is also a rise in polytrauma with complicated musculoskeletal injuries and their post traumatic problems, especially "fracture disease." (1) The person involved at a time is the only bread-earner of the family. Earlier and effective management of fracture is essential and hence that the person can return to his work at the earliest. A longer stay in the hospital means loss of more number of working days and money, thereby

worsening the economic conditions of family. Every fracture leads to a complex tissue injury involving bone and surrounding soft-tissues. Immediately after fracture and during the repair phase, we see local circulatory disturbance and manifestations of local inflammation as well as pain and reflex immobilization. (2)

Tibia fractures are among the most common conditions treated by orthopaedic surgeons in their daily practice. Tibia fracture is one of the most common fractures of the lower limbs with highest number of treatment alternatives.(3) Tibial fractures are caused most commonly due to high energy trauma

like road traffic accidents(RTA), fall from height, assault and also due to pathological causes like bone infections. There is a high rate of postoperative complications in distal tibial fractures including compartment syndrome, vascular injury especially in displaced fractures. The surgical management options for treatment of distal shaft tibia fractures vary depending on the type of fractures, age group, bone density, soft tissue status and associated complications.(4) These include open reduction and plate osteosynthesis, minimally invasive plate osteosynthesis, external fixators, ring fixators and interlock nailing.(5-8) Stable internal fixation and early mobilization is one of the current concepts in fracture treatment.(8)

The optimal method of surgical treatment of fractures of the distal third tibia remains debatable. The goals of treatment are the same as that of all tibial shaft fractures, i.e. anatomical alignment and stable fixation, minimal soft tissue injury, early joint motion, early weight bearing and rapid healing.(10-13) The intramedullary interlock nailing under image intensifier fulfils these objectives. In the present study, we are evaluating the role of mobilization efficacy and results of nailing and plating compression in management of distal shaft tibial fractures on the basis of VAS score.

## MATERIALS & METHODS

The present cross-sectional prospective study was conducted at department of Orthopaedics of our Multi-speciality hospital. The study duration was of three months. A sample size of 100 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. Patients who had unilateral, complete distal third tibia shaft fractures who were operated with either intramedullary nailing or plating were enrolled for the study. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. Young patients (age <18 years), pathological fractures, intra articular fractures, patients with fractures or abnormalities in contralateral lower limb were excluded from the study.

All patients underwent routine blood investigations and planned for surgery after pre anesthetic checkup. Fractures were defined on the basis of AO classification and were operated upon either by nailing or plating depending on the type of injury. After the surgery, all patients followed strict physiotherapy protocol depending on their pain. Patients were started with active toe movements and ankle ROM exercises immediately post operatively. On the day after surgery, patients were started with static and dynamic quadriceps exercises. Patients were advised non-weight bearing walking on the second post op day. In stable fractures, patients started partial weight bearing walking on 5th post op day. Full weight bearing walking was started at 6 weeks post operatively. In osteoporotic patients, weight bearing was delayed. Patients were evaluated for pain on the basis of VAS Score at regular intervals starting from postoperative day 1, day 5, day 14, 6 weeks, 3 months and 6 months. 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, out of 100 patients 73 were males and 27 were females, so male predominance was seen. Majority of patients i.e. 40 were in 18-30 age group followed by 23 in 31-40 age group. While 18, 11 and 08 patients were in 41-50, 51-60- and 61-70-years age group respectively. The mean age of presentation was  $42.6 \pm 7.4$  years.(Table 1)

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

Age (years)	Male	Female	Total (%)
18-30	28	12	40
31-40	15	8	23
41-50	14	4	18
51-60	9	2	11
61-70	7	1	08
Total	73	27	100

In present study in 57% cases left limb was affected. In majority of cases 66% mode of injury was RTA. This was followed by fall from height 31%. In the present series full weight bearing time was early (<3 weeks) with 60% and 40% patients within delay (>3 weeks) of surgery. Early and delay mobilization following associated injury were managed with accordingly. (Table 2)

VAS score was significant (<0.05) better in first month (7.6±0.84) and (2.3±0.5) six month in early (<3 weeks) mobilization. Pearson Correlation was also significant statistically of VAS score and mobilization. In delay mobilization (>3 weeks) VAS score was statistically significant (<0.05) better in first month (8.1±0.3) and (3.4±0.4) six month. Pearson Correlation was also significant statistically of VAS score and mobilization.(Table 3)

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

Mobilization (Full weight bearing)	Procedure	Total	
		Plating	Nailing
Early (<3 weeks)	26	34	60
Delay (>3 weeks)	2	38	40

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

		Mobilization (Full weight bearing)		
		Early (<3 weeks)	Delay (>3 weeks)	P value
VAS score	1 month	7.6±0.84	8.1±0.3	<0.05
	3month	5.5±0.60	5.9±0.63	0.068
	6month	2.3±0.5	3.4±0.4	<0.05

## DISCUSSION

Tibia fractures present a spectrum of soft tissue and bony injuries that can produce permanent disabilities. Their treatment is challenged by fracture comminution, instability, displacement and extensive soft tissue injures. The goals of treatment are restoration of joint congruity, normal limb alignment, knee stability and a functional range knee motion. The major limitations of non-operative treatment include inadequate reduction of articular surface and ineffective limb alignment control. Furthermore, the extended period of hospitalization and recumbence are not cost-effective in today's health care environment. It must be emphasized that this study is only short term follow up of six months and the discussion that follows is essentially a preliminary assessment.

The age of the patients in the study ranged from 18 and 80 years (40%) with average age of 42.01±15.1 years. Higher incidence in this age is mostly due to active life style and prone for accidents resulting in high velocity injuries. The incidence of fractures in our study was more common in males (72.6%) which can be attributed to the risk of injury due to occupational and ambulant life led by them. Among modes of injury RTA are the most common (66%) with more (56.6%) fractures on left side. These are comparable to the studies made by Dendrinis et al, Barei et al and Patil et al.(10-12)

Among the 100 patients full weight bearing time was early (<3 weeks) with (60%) and (40%) patients within delay (>3 weeks) of surgery. VAS score was significant better in early (<3 weeks) mobilization and in nailing treatment of tibial fractures in first month (7.6±0.84 and 8.1±0.3) and (2.3±0.5 and 3.4±0.4) at the final follow-up. Vas Score was also found correlation significant with process and mobilization. The results of functional evaluation showed 86.7% excellent results and 13.3% good results. Rambold in 1960 reported that internal fixation of tibial plateau fractures and early mobilization contributes to good anatomical and functional results.(13) Jensen in 1990 got good results by surgical treatment of proximal tibia fractures.(14) Chaix et al reported 86% good to excellent results by surgical means of treatment.(15) Lee et al reported good to excellent results by surgical means of less invasive stabilization system treatment.(16) Feng et al reported good results when fixed with locking compression plate in comparison with dynamic compression plate with an additional benefit of minimally invasive surgery.(17) Kim et al

reported good results with minimally invasive plate osteosynthesis technique in treatment of open proximal tibial fractures with adequate soft tissue coverage.(18) Ahmed et al In January 2017 done study on Evaluation of outcome of management of distal tibia fracture using distal tibia locking plate concluded that compression locking plate is a good device for stabilizing distal tibia fractures.(19) The period of immobilization was again individualized depending on the security of rigid fixation and other circumstances demand. The benefits of early knee motion include - reduce knee stiffness and improved cartilage healing (regeneration). However, these benefits are to be cautiously balanced by risks, including loss of fracture reduction, failure of internal fixation and compromised ligament and soft tissue healing. Several studies stated that the prognosis is given by the degree of displacement, type of fracture, method of treatment and quality of postoperative care.

## CONCLUSION

Surgical management of tibial fractures will give excellent anatomical reduction and rigid fixation to restore articular congruity, help to facilitate early mobilization and reducing post-traumatic osteoarthritis and hence to achieve optimal knee function. Nailing remains a good choice in comminuted or more severe patterns of tibial fractures. We recommend and here conclude from our study that closed interlocking nailing appears to be promising method of treatment of unstable tubila fractures in adults without any external splintage after adequate stabilization and early weight bearing leading to excellent functional results in most of cases. This implant leads to an extremely low rate of infection and alignment with early mobilization and decreased limitation of motion of knee and ankle joint. Using all current surgical principles and techniques, has excellent clinico-radiological outcome and is relatively safe.

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