

Pattern And Site Of Open Tibial Shaft Fractures Type 3 In A Tertiary Care Centre Of North India

¹Manmeet Singh, ²Tejpal Singh, ³Sachin Kudyar, ⁴Anil Gupta, ⁵Ankita Mahajan

¹Senior resident, Department of orthopaedics, GMC Udhampur,

²Senior resident, Department of orthopaedics, IGMC Shimla,

³Post graduate, Department of orthopaedics GMC Jammu,

⁴Professor and Head, Department of orthopaedics, GMC Udhampur.

⁵Post graduate, Department of Anaesthesia, GMC Jammu.

Corresponding Author: ²Tejpal Singh

Email: tejpalsinghortho@gmail.com

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Abstract

BACKGROUND: Tibia is one of commonest long bone fracture seen in emergency. Major causes of fracture shaft of tibia include road traffic accidents, fall from height, blast injuries, etc.

AIM/PURPOSE OF THE STUDY: To study the pattern, age, sex, type of fracture and location of fracture in patients with fracture shaft of tibia.

MATERIAL AND METHODS: This is a observational study conducted at government Medical College, Jammu among thirty open tibial shaft fractures. the study period was from November 2020 to November 2021.

RESULTS: All total of 30 tibial shaft fracture in 30 patients with mean age of 35.6 years(18-75years) were reviewed. The cause of the injury was mostly due to road traffic accidents (86.6%) and rest were due to fall from height (13.4%). Out of 30 patients 11 patients (36.6%) had open type 3a fracture and 19 patients (63.4%) had open type 3b fractures. Most of the patients (46.6%) had comminuted fracture pattern, 26.6% patients had oblique, 13.3% had segmental and 13.3% had transverse fracture pattern. About 80% patients in our study had fracture at distal 1/3rd of the shaft of tibia followed by middle 1/3rd in 16.6% and proximal 1/3rd in 3.3% of patients.

CONCLUSION: In our present study, most tibial shaft fractures were due to road traffic accident and most common fracture pattern was comminuted fracture with distal 1/3rd of tibia being the most common site. So, the efforts should be made by the concerned authorities for improving the roadways system and making strict laws and to provide standard but affordable health care for victims of road traffic crashes.

KEY WORDS: Tibia, Distal 1/3rd, Fracture, Traffic.

INTRODUCTION

Fracture of tibial shaft constitutes a major trauma mostly sustained by young adults during high-energy injuries. Open tibial fracture due to the increased propensity of infection has the potential of resulting in amputation or even death. These fractures are usually caused by high velocity trauma, bullet injuries, etc. the anteromedial surface of tibia is subcutaneous which makes this region vulnerable to severe bone injury and frequent soft tissue injury. Approximately two tibial shaft fractures occur per 1000 individuals and 26 per 100,000 populations per year. Males are more commonly affected than females with highest incidence in young males between age group 15- 19 and over the age of 80 in females. The amount of energy absorbed by a fracture which can be estimated from the history of injury, strongly influences the timing and the type of treatment. Recent data demonstrate better outcomes with internal fixation methods in most open tibial fractures, but external fixation continues to be an appropriate choice in more severe injuries.

The most comprehensive classification of tibial diaphyseal fractures is the Orthopaedic Trauma Association (OTA) classification initially described by the AO group. This is a morphologic classification based on initial

anteroposterior and lateral radiographs. Gustilo and Anderson in 1976 gave classification for open fractures based upon increasing soft tissue injury, degree of contamination, delay before treatment, and requirement for vascular surgery. According to Tscherne classification, open fractures are divided into grade 1 to grade 4. This system includes soft tissue damage and compartment syndrome, which are not included in other grading schemes.

The goal of treatment is to obtain a pain free weight bearing and functional range of motion of the knee and ankle joints. The decision for the treatment depends on many factors, including the patient's overall health, the extent of soft tissue injury, associated injuries of thigh, knee and foot and the pattern of injury to the bone itself. Operative techniques include external fixation, intramedullary nailing and plating. Delayed union, non-union and infection are relatively common complications of tibial shaft fractures.

MATERIAL AND METHODS

The study was conducted in the department of orthopaedics of government Medical College, Jammu between November 2020 to November 2021. It was a prospective study. Written informed consent was taken from all the patients.

Inclusion criteria was all adult patients with open tibial shaft fractures with Gustilo Anderson type 3 (a, b and c). Paediatric patients, open tibial shaft fractures with Gustilo Anderson type 1 and 2 and intra-articular fractures were excluded from the study.

Every patient coming in the emergency department was initially assessed, resuscitated and investigated. Regarding location tibial shaft is divided into upper, middle and lower one third. Different pattern of tibial fractures observed were comminuted, segmental, oblique and transverse fractures.

Treatment performed was evaluated according to fracture pattern with external fixator, intramedullary interlocking nail and PTB cast. The time to union was based on clinical as well as radiological assessment.

RESULTS

Out of 30 patients included in the study, 60% patients were in age group 15-35 years with mean age of 35.6 years. In our study, 27 were male and 3 were female (Male: Female= 9:1) Hence, there had been a higher incidence of open tibial type 3 fractures in males in our study.

In our study around 63.4 % of the fractures were open type 3b and only 36.4% were open type 3a.

In our study, n= 14 (46.6%) patients had comminuted fractures, n= 8 (26.6%) patients had oblique fractures, n= 4 (13.3%) patients had segmental fractures and n= 4(13.3%) patient's had transverse fractures. About 80% patients in our study had fracture at distal 1/3rd of the shaft of tibia followed by middle 1/3rd in 16.6% and proximal 1/3rd in 3.3% of patients.

In our study design of 30 patients, rate of infection n= 2(20%) in Nail group was less than the External Fixator group n= 5(25%) patients in. Malunion and non-union was seen in External Fixator group n= 2 (10%) and n=3(15%) patients respectively. Ankle stiffness was seen more in Ex. Fix group n= 3(15%) than IL nail n=1(5.5%) patients.

DISCUSSION

In this study, 30 patients with age ranging from 15-75 years were analysed and mean age was found to be 35.6 years with male predominance. Male to female ratio was 9:1(Figure 1). Hence it is concluded that there is higher incidence of open tibial fractures type 3 in males. Abdel Rahim Elneil et al., (2018), in his study reported mean age of 43.3 years, most frequently occurring in young adult males and elderly females.

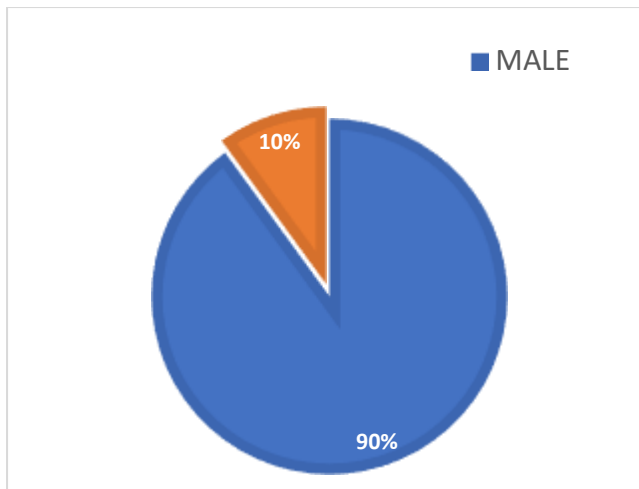


Figure 1 showing distribution of patients according to gender.

Out of 30 patients in our study design, majority of patients were open fractures Gustilo and Anderson type 3b (63.4%) and only (36.4%) were open Gustilo and Anderson type 3a. Innocent E. Abang et al., (2018), in his study on 34 open tibial fractures concluded that majority of them were open type 3a (n=20) and rest of them were (n= 14) type 3b. RW Trickett et al., (2015), in his study on 28 patients concluded that majority of patients were open type 3b (n= 15) , followed by open type 3a (n= 9) and 3c (n= 4) (Figure 2).

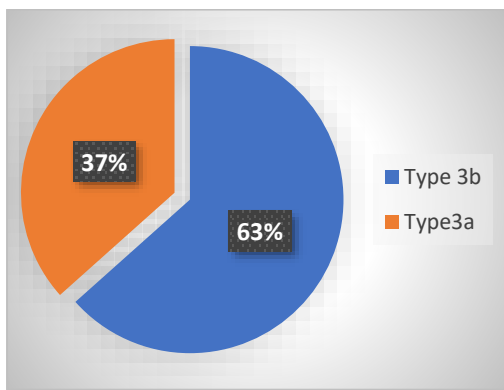


Figure 2 showing patients according to Gustilo and Anderson type.

In our study design, out of 30 patients, n=14 (46.6%) patients had comminuted fractures, n= 8 (26.6%) patients had oblique fractures, n= 4 (13.3%) patients had segmental fractures and n= 4(13.3%) patients had transverse fractures. Innocent E. Abang et al., 2018, A review of the pattern of open tibial shaft fractures study shows that comminuted fractures were predominant n= 21 (52.5%). Oblique fractures n= 10 (25%), segmental fractures n = 5 (12.5%), and transverse fractures n = 2 (5%) in descending order (Figure 3).

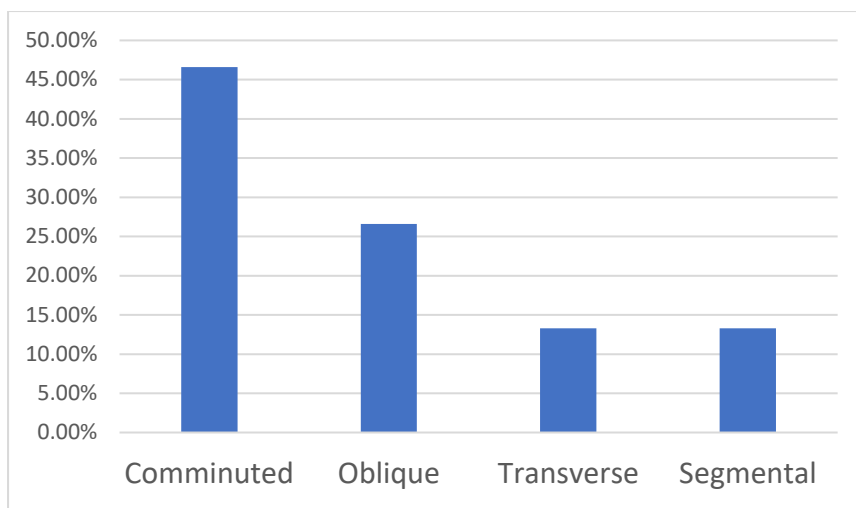


Figure 3 showing distribution of patients according to fracture pattern.

80% patients in our study had fracture at distal 1/3rd of the shaft of tibia followed by middle 1/3rd in 16.6% and proximal 1/3rd in 3.3% of patients. Baral R (2013) in his study found that most common site of open tibial fractures was distal one third (49.2%) (Figure 4).

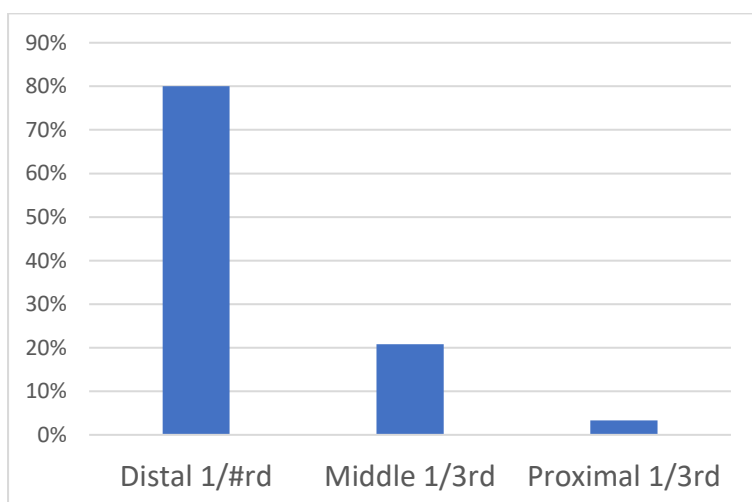


Figure 4 showing distribution of patients according to site/level of injury.

In our study design of 30 patients, rate of infection n= 2(20%) in Nail group was less than the Ex. Fix group n= 5(25%). Malunion and non-union was seen in Ex. Fix group n= 2 (10%) and n=3(15%) patients respectively. Ankle stiffness was seen more in Ex. Fix group n= 3(15%) than IL nail n=1(5.5%) patients. Innocent E. Abang et al., 2018, The complications observed in this study include pin tract infection 16 (40%). This is a known complication of treatment of fractures with external fixators.

CONCLUSION

We have concluded that type 3b open tibial comminuted fractures are fairly common among young population in males and are mostly caused by road traffic accidents; regarding location they occurred more frequently at distal one third.

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