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ORIGINAL ARTICLE

TIBIAL FRACTURE: COMPARISON OF COMPLICATIONS OF DIFFERENT TREATMENT MODALITIES

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ABSTRACT:

Background: Closed fractures of the tibial shaft are common. Tibia shaft fractures are the most common long bone fractures. They usually occur in young and active patients and are often due to high-energy trauma like motor vehicle accidents, sports or falls from height. The aim of present study was to report the complication associated with different methods of treatment. **Materials & Methods:** This study was conducted in the department of orthopaedics in 2012. It consisted of 400 patients having tibial fractures. It involves males (216) and females (184). Patients were divided into 4 groups of 100 patients each. Group I treated with plaster cast, Group II treated with fixation with plate and screws, Group III treated with reamed intramedullary nail and group IV treated with unreamed intramedullary nail. Factors such as time to fracture healing, numbers of delayed union, nonunion and malunion, incidence of infection, and other complications were recorded in all groups. **Results:** Patients were divided into group I treated with plaster cast, Group II treated with fixation with plate and screws, Group III treated with reamed intramedullary nail and group IV treated with unreamed intramedullary nail. Each group consisted of 100 patients (males- 50, females- 50). Non union or delayed union seen in group I was 18%, group II was 3%, group III was 9% and group IV was 17.10%. The difference was significant (P<0.05). Malunion seen in group I was 32%, group II was 1%, group III was 4% and group IV was 12%. The difference was significant (P<0.05). There was no superficial infection in group I. In group II, 10% of infection was seen. IN group III, it was 3% and in group IV, it was reported to be 1%. The difference was significant (P<0.05). The need for reoperation in group I was 9%, group II was 5%, group III was 13% and in group IV was 24%. The difference was significant (P<0.05). **Conclusion:** Different treatment modalities have been performed for tibial fracture. None has been found effective. Thus selection of specific technique is necessary to avoid complication.

Key words: Malunion, non union, tibial

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INTRODUCTION

Closed fractures of the tibial shaft are common. Tibia shaft fractures are the most common long bone fractures. They usually occur in young and active patients and are often due to high-energy trauma like motor vehicle accidents, sports or falls from height.[1] Direct trauma like road traffic accidents often cause concomitant severe soft tissue damage with a high incidence of open fractures. The lack of soft tissue covering of the tibial shaft and difficult blood supply make these fractures vulnerable to infection and non-union. Tibial shaft fractures are severe injuries and may result in permanent disability.[2]

Tibial shaft fractures are classified according to the AO classification of long bones (Type 42) and are divided into simple, wedge and complex fractures (Type 42. A/B/C). Type A fractures are subdivided into spiral, oblique and transverse fractures, type B into spiral wedge, oblique wedge and transversal wedge fractures. Type C fractures are subdivided into spiral, segmental and irregular fractures. Closed soft tissue injuries can be classified by the classification of Tscherne/Oestern and open fractures by the classification given by Gustilo/Anderson.[3]

Despite different treatment modalities, controversy still exists as to the best method of treatment. Stable, non displaced fractures of the tibial shaft can be treated conservatively by cast application. Conservative treatment

in a thigh plaster is performed for approximately 4 weeks. Afterwards a functional brace can be used for 8 to 12 weeks.[4] Intramedullary nailing is indicated for open and closed isolated tibia shaft fractures. This includes oblique, transverse fractures, segmental fractures, torsion fractures and debris fractures of the tibial shaft as well as open fractures even with bone loss. Conventional plate osteosynthesis used to be the method of choice for tibial shaft fractures without soft tissue injury until recently being replaced by intramedullary nailing with locking screws.[5]
The aim of present study was to report the complication associated with different methods of treatment.

MATERIALS & METHODS

This study was conducted in the department of orthopaedics in 2012. It consisted of 400 patients having tibial fractures. It involves males (216) and females (184). Patient demographic record such as name, age, gender etc was recorded. Patients were divided into 4 groups of 100 patients each. Group I treated with plaster cast, Group II treated with fixation with plate and screws, Group III treated with reamed intramedullary nail and group IV treated with unreamed intramedullary nail.
Factors such as time to fracture healing, numbers of delayed union, nonunion and malunion, incidence of infection, and other complications were recorded in all groups. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

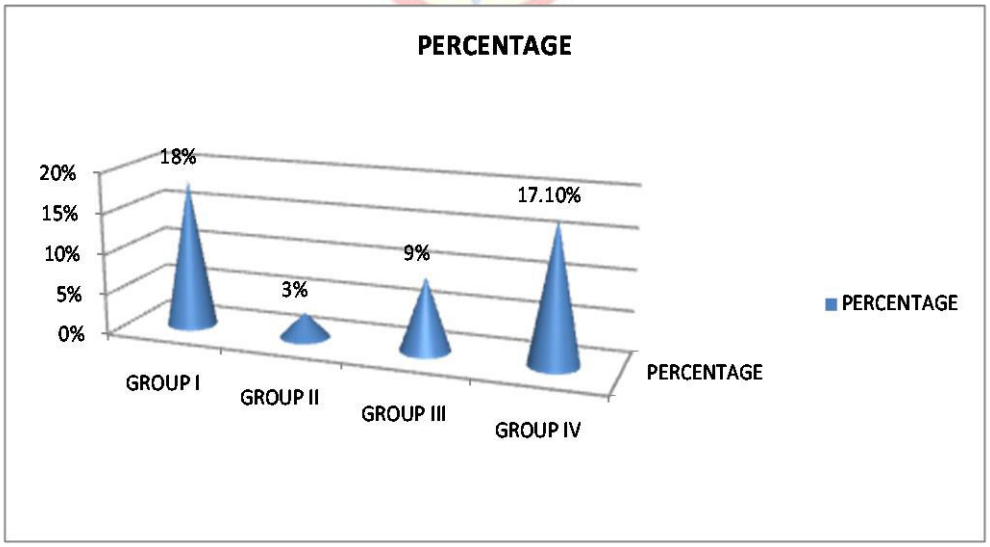
RESULTS

Table I shows that patients were divided into group I treated with plaster cast, Group II treated with fixation with plate and screws, Group III treated with reamed intramedullary nail and group IV treated with unreamed intramedullary nail. Each group consisted of 100 patients (males- 50, females- 50). The difference was non significant (P>0.05). Graph I shows that non union or delayed union seen in group I was 18%, group II was 3%, group III was 9% and group IV was 17.10%. The difference was significant (P<0.05). Graph II shows that malunion seen in group I was 32%, group II was 1%, group III was 4% and group IV was 12%. The difference was significant (P<0.05). Graph III shows that there was no superficial infection in group I. In group II, 10% of infection was seen. IN group III, it was 3% and in group IV, it was reported to be 1%. The difference was significant (P<0.05). Group IV shows that the need for reoperation in group I was 9%, group II was 5%, group III was 13% and in group IV was 24%. The difference was significant (P<0.05).

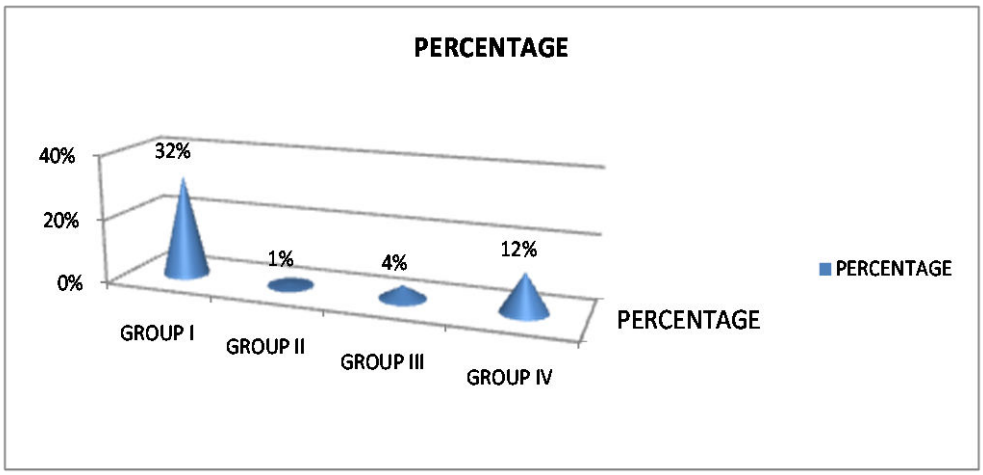
Table I Distribution of patients in different groups

Group	Group I		Group II		Group III		Group IV	
Treatment	Plaster cast		Fixation with plate		Reamed intramedullary nail		Unreamed intramedullary nail	
Gender	Male	Female	Male	Female	Male	Female	Male	Female
Number	50	50	50	50	50	50	50	50

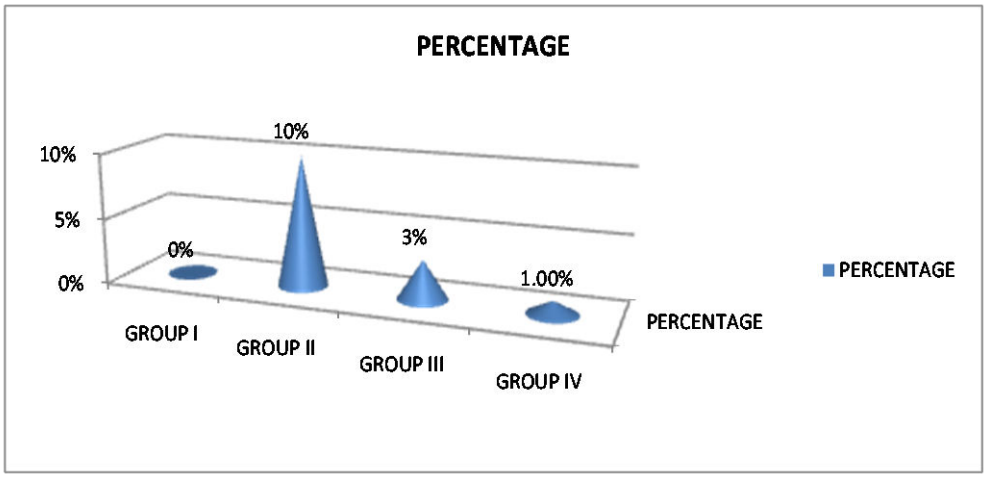
Graph I Delayed and non union in all groups



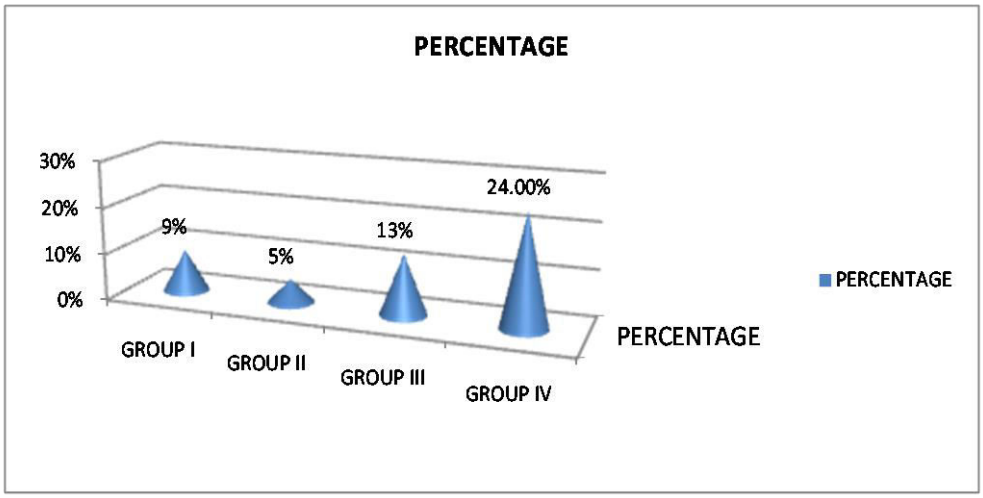
Graph II Malunion in all groups



Graph III Superficial infection in all groups



Graph IV Need for reoperation in all groups



DISCUSSION

The aims of the therapy of tibial shaft fractures are full weight bearing fast, solid bony union, avoidance of pseudarthrosis, regain full range of motion of the knee and ankle joint, avoiding infections and further soft tissue damage. The aim of present study was to report the complication associated with different methods of treatment. It consisted of 400 patients having tibial fractures. It involves males (216) and females (184). Patient demographic record such as name, age, gender etc was recorded. Patients were divided into 4 groups of 100 patients each. Group I treated with plaster cast, Group II treated with fixation with plate and screws, Group III treated with reamed intramedullary nail and group IV treated with unreamed intramedullary nail.

Our study revealed that non union or delayed union seen in group I was 18%, group II was 3%, group III was 9% and group IV was 17.10%. The high prevalence seen with plaster cast has been supported by Harrington et al.[6]

We also reported cases of malunion among all groups. Malunion seen in group I was 32%, group II was 1%, group III was 4% and group IV was 12%. Similar results were seen with the study of Krettek C et al[7]. Wiss DA[8] in her study found maximum number of malunion with plates and screws. We did not report any superficial infection or osteomyelitis in group I. In group II, 10% of infection was seen. IN group III, it was 3% and in group IV, it was reported to be 1%. The high prevalence of infection with plates and screws has been supported in the study of Gregory P et al[9]. The need for reoperation in group I was 9%, group II was 5%, group III was 13% and in group IV was 24%. Similar results were seen in study of Oni OO et al[10]. However, Batten RL[11] reported higher prevalence of reoperation with plates.

CONCLUSION

Different treatment modalities have been performed for tibial fracture. None has been found effective. Thus selection of specific technique is necessary to avoid complication.

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